# GeoNetwork User Manual

***Release 2.6.5-SNAPSHOT***

**GeoNetwork**

November 02, 2011

# Contents


**1 Preface** **3**
- 1.1 About this Project . . . 3
- 1.2 License Information . . . 3
- 1.3 Author Information . . . 4

**2 Quick Start Guide** **5**
- 2.1 Geographic Information Management for all . . . 5
- 2.2 Getting Started . . . 8
- 2.3 Viewing and Analysing the Data . . . 20
- 2.4 Adding new Data and Information . . . 27
- 2.5 Entering Metadata for your Map . . . 34
- 2.6 Uploading a New Record using the XML Metadata Insert Tool . . . 49
- 2.7 Metadata in Spatial Data Management . . . 50
- 2.8 Installing the software . . . 54

**3 Administration** **61**
- 3.1 Basic configuration . . . 61
- 3.2 User and Group Administration . . . 67
- 3.3 OGC CSW Server configuration . . . 72
- 3.4 Import facilities . . . 74
- 3.5 Harvesting . . . 79
- 3.6 Metadata ownership . . . 98
- 3.7 Templates . . . 101
- 3.8 Thesaurus . . . 103
- 3.9 GeoNetwork's Administrator Survival Tool - GAST . . . 108
- 3.10 Localization . . . 111
- 3.11 Import / export tools . . . 112

**4 Glossary of Metadata Fields Description** **115**

**5 ISO Topic Categories** **119**

**6 Free and Open Source Software for Geospatial Information Systems** **123**
- 6.1 Web Map Server software . . . 123

6.2 GIS Desktop software . . . 123
6.3 Web Map Viewer and Map Server Management . . . 123

**7 Frequently Asked Questions** **125**
7.1 HTTP Status 400 Bad request . . . 125
7.2 Metadata insert fails . . . 125
7.3 Thumbnail insert fails . . . 125
7.4 The data and data/tmp directories . . . 126

**8 Glossary** **127**

**Index** **131**

Welcome to the GeoNetwork User Manual v2.6.5-SNAPSHOT. The manual is a comprehensive guide to all aspects of using GeoNetwork opensource.

Other documents:

GeoNetwork Developer Manual

GeoNetwork User Manual (PDF)

CHAPTER 1

# Preface

## 1.1 About this Project

This document provides guidelines to install, configure, use and customise the GeoNetwork opensource software.

The GeoNetwork project started out as a Spatial Data Catalogue System for the Food and Agriculture organisation of the United Nations (*FAO*), the United Nations World Food Programme (*WFP*) and the United Nations Environmental Programme (*UNEP*).

At present the project is widely used as the basis of Spatial Data Infrastructures all around the world.

The project is part of the Open Source Geospatial Foundation (*OSGeo*) and can be found at GeoNetwork opensource.

## 1.2 License Information

### 1.2.1 Software

The GeoNetwork opensource software is released under the *GPL* v2 license and can be used and modified free of charge.

### 1.2.2 Documentation

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The document is written in reStructuredText format for consistency and portability.

## 1.3 Author Information

The documentation was written by the GeoNetwork opensource Developers and other community members. The basis for the reStructuredText based documentation is based on the work done by the GeoServer project and the Sphinx framework.

If you have questions, found a bug or have enhancements, please contact us through the GeoNetwork opensource Development Mailing list at geonetwork-devel@lists.sourceforge.net

CHAPTER 2

# Quick Start Guide

## 2.1 Geographic Information Management for all

### 2.1.1 Introduction

#### What is GeoNetwork opensource

GeoNetwork opensource is a standard based and decentralised spatial information management system, designed to enable access to geo-referenced databases and cartographic products from a variety of data providers through descriptive metadata, enhancing the spatial information exchange and sharing between organisations and their audience, using the capacities and the power of the Internet. The system provides a broad community of users with easy and timely access to available spatial data and thematic maps from multidisciplinary sources, that may in the end support informed decision making. The main goal of the software is to increase collaboration within and between organisations for reducing duplication and enhancing information consistency and quality and to improve the accessibility of a wide variety of geographic information along with the associated information, organised and documented in a standard and consistent way.

Main Features

- Instant search on local and distributed geospatial catalogues
- Uploading and downloading of data, documents, PDF's and any other content
- An interactive Web map viewer that combines Web Map Services from distributed servers around the world
- Online map layout generation and export in PDF format
- Online editing of metadata with a powerful template system
- Scheduled harvesting and synchronisation of metadata between distributed catalogues
- Groups and users management
- Fine grained access control

### Background and evolution

The prototype of the GeoNetwork catalogue was developed by the Food and Agriculture organisation of the United Nations (FAO) in 2001 to systematically archive and publish the geographic datasets produced within the organisation. The prototype was built on experiences within and outside the organisation. It used metadata content available from legacy systems that was transformed into what was then only a draft metadata standard, the ISO 19115. Later on, another UN agency, the World Food Programme (WFP) joined the project and with its contribution the first version of the software was released in 2003 and operational catalogues were established in FAO and WFP. The system was based on the ISO19115:DIS metadata standard and embedded the Web Map Client InterMap that supported Open Geospatial Consortium (OGC) compliant Web Map Services. Distributed searches were possible using the standard Z39.50 catalogue protocol. At that moment it was decided to develop the program as a Free and Open Source Software to allow the whole geospatial users community to benefit from the development results and to contribute to the further advancement of the software.

Jointly with the UN Environmental Programme (UNEP), FAO developed a second version in 2004. The new release allowed users to work with multiple metadata standards (ISO 19115, FGDC and Dublin Core) in a transparent manner. It also allowed metadata to be shared between catalogues through a caching mechanism, improving reliability when searching in multiple catalogues.

In 2006, the GeoNetwork team dedicated efforts to develop a DVD containing the GeoNetwork version 2.0.3 and the best free and open source software in the field of Geoinformatics. The DVD was produced and distributed in hard copy to over three thousand people and is now also available for download from the GeoNetwork Community website.

GeoNetwork opensource is the result of the collaborative development of many contributors. These include among others the Food and Agriculture organisation (FAO), the UN Office for the Coordination of Humanitarian Affairs (UNOCHA), the Consultative Group on International Agricultural Research (CSI-CGIAR), The UN Environmental Programme (UNEP), The European Space Agency (ESA) and many others. Support for the metadata standard ISO19115:2003 has been added by using the ISO19139:2007 implementation specification schema published in May 2007. The release also serves as the open source reference implementation of the OGC Catalogue Service for the Web (CSW 2.0.2) specification. Improvements to give users a more responsive and interactive experience have been substantial and include a new Web map viewer and a complete revision of search interface.

### The use of International Standards

GeoNetwork has been developed following the principles of a Free and Open Source Software (FOSS) and based on International and Open Standards for services and protocols, like the ISO-TC211 and the Open Geospatial Consortium (OGC) specifications. The architecture is largely compatible with the OGC Portal Reference Architecture, i.e. the OGC guide for implementing standardised geospatial portals. Indeed the structure relies on the same three main modules identified by the OGC Portal Reference Architecture, that are focused on spatial data, metadata and interactive map visualisation. The system is also fully compliant with the OGC specifications for querying and retrieving information from Web catalogues (CSW). It supports the most common standards to specifically describe geographic data (ISO19139 and FGDC) and the international standard for general documents (Dublin Core). It uses standards (OGS WMS) also for visualising maps through the Internet.

### Harvesting geospatial data in a shared environment

Within the geographic information environment, the increased collaboration between data providers and their efforts to reduce duplication have stimulated the development of tools and systems to significantly

improve the information sharing and guarantee an easier and quicker access of data from a variety of sources without undermining the ownership of the information. The harvesting functionality in GeoNetwork is a mechanism of data collection in perfect accordance with both rights to data access and data ownership protection. Through the harvesting functionality it is possible to collect public information from the different GeoNetwork nodes installed around the world and to copy and store periodically this information locally. In this way a user from a single entry point can get information also from distributed catalogues. The logo posted on top each harvested record informs the user about the data source.

### 2.1.2 GeoNetwork and the Open Source Community Development

The community of users and developers of the GeoNetwork software has increased dramatically since the release of version 2.0 in December 2005 and the subsequent releases. At present, the user and developer mailing lists count well over 250 subscriptions each. Subscription to these lists is open to anyone interested. The archive of the mailing lists provides an important resource for users and can be freely browsed online. Members provide feedback within the community and provide translations, new functionalities, bug reports, fixes and instructions to the project as a whole. Building a self sustaining community of users and developers is one of the biggest challenges for the project. This community-building process relies on active participation and interaction of its members. It also relies on building trust and operating in a transparent manner, thereby agreeing on the overall objectives, prioritization and long term direction of the project. A number of actions have been taken by the project team to facilitate this process.

The foundation for the establishment of a GeoNetwork Advisory Board was laid at the 2006 workshop in Rome and membership criteria were defined.

A work plan is presented and discussed at the yearly GeoNetwork workshop; subsequently, the plan is maintained and updated throughout the year where needed. The project management team reports back to the advisory board about the reached developments and objectives during the annual workshops.

Two public Websites have been established. One focuses on the users of the software (http://geonetwork-opensource.org), while the other one is dedicated to the developers (http://trac.osgeo.org/geonetwork). Both can be updated and maintained online by trusted members of the community. They provide documentation, bug reporting and tracking, Wiki pages et cetera. A small part of the community connects through Internet Relay Chat (IRC) on a public `irc://irc.freenode.net/geonetwork` channel. But most interaction takes place on the user and the developer mailing lists.

During the 2006 workshop, the Project Advisory Board decided to propose the GeoNetwork opensource project as an incubator project to the newly founded Open Source Geospatial Foundation (OSGeo). This incubation process is currently ongoing but close to conclusions. The project Websites have been moved to servers accessible under the umbrella of the OSGeo foundation. Web pages have been updated to reflect the OSGeo principles and a source code review performed.

Source code is maintained in a publicly accessible code repository, hosted at an independent service provider, SourceForge.net that hosts thousands of FOSS projects. Developers and users have full access to all sections of the source code, while trusted developers can make changes in the repository itself. A special mailing list has been established to monitor changes in the code repository. This so-called "commit mailing list" delivers change reports by email to its subscribers.

The documentation is written in reStructuredText format using the Sphinx framework to ensure versioning and support of multiple output formats (e.g. HTML and PDF).

## 2.2 Getting Started

Please make sure you have opened the home page of the GeoNetwork based catalogue.

If you installed the software on your local machine and started it, the default URL is http://localhost:8080/geonetwork

There are many different ways to search the catalogue for maps and other geographic data. This guide will introduce you to the most popular search methods: default, advanced and by category. Whichever search you choose, remember that you will see results based on your privileges and assigned work group (*privileges*).

**Note:** The term *data* in this application refers to datasets, maps, tables, documents, etc. that are linked to the metadata of a specific record.

### 2.2.1 Default Search

The default search allows you to search text within the entire record, such as keywords of the metadata and/or geographic location.

**Free text search.** *Type* a search term in the *What?* field. You can type anything here (free text). You can use quotes around text to find exact combinations of words.

Text and operators (and, or, not) are not case sensitive.

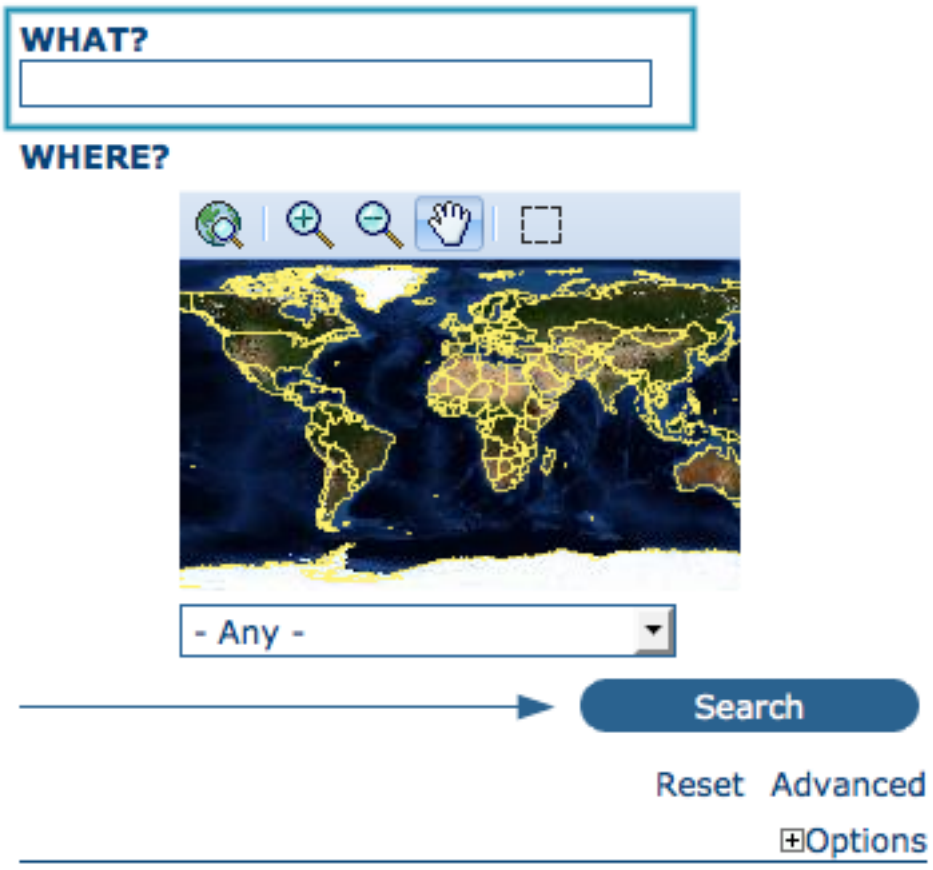



Figure 2.1: *The free text field.*

**Geographic search.** For the geographic search, two options are available for selecting a particular region to limit the search:

You can select a **region** from a predefined list;

Figure 2.2: *The region field*

You can select your own *area of interest* in a more interactive way. A small global map is shown on the screen from which you can drag and drop the frame of your location area. Just click on the button on the upper right of the map screen.

**Perform search.** Both types of search, free text search and geographic search can be combined to restrict the query further.

Click the *Search* button to proceed and show the results.

### 2.2.2 Searching by Categories

An additional way to search data within the GeoNetwork database, from the home page, is searching by **Category**. A list of categories is provided to the user to identify data at a more generic level: **Applications**, **Audio/Video**, **Case study and best practises**, **Conference proceedings**, **Datasets**, **Directories**, **Interactive resources**, **Maps and graphics**, **Other information resources**, **Photo**.

To search only for maps, click on **Maps and Graphics**. A list of maps will be displayed from which you may view details of every single map; just clicking on the **Metadata** button of the map you wish to review.

Figure 2.3: *Interactive Area Of Interest map*

Figure 2.4: *The Search button*

Figure 2.5: *Search by Category*

### 2.2.3 Advanced Search

The advanced search option works similarly to the default search. However, you can be more specific in your search criteria as it offers different elements to look for data, each of them focusing one of the following aspects: *What?, Where?, When?*

To perform an **advanced search**, from the home page **click Advanced** just below the search bottom.

In the **WHAT?** section the elements are all related to the data content. Through them, in addition to searching only free keywords in the entire metadata content, you can also search directly in the title or abstract fields and add more keywords to customise your search further. You can also specify the level of accuracy you wish to reach in performing your search.

- To search by **Title, Abstract, Free Text, or Keyword(s)** type any text into the respective field. You can enter information in one or multiple field(s). If you do not want to search by a given field, simply leave it blank;
- You can choose the **accuracy of your search**, in terms of spelling words, from **Precise** = 1 to **Imprecise** = 0.2, through 3 more consecutive steps which are equal to 0.8, 0.6, 0.4.

The **WHERE?** parameters, which are related to the spatial extent, allow you, as in the default search, either to select your own area of interest or to select a predefined region from the drop-down list. In this section you can also type the geographic coordinates of a specific location that is not available from the above list.

- To select **your own area of interest**, drag and drop the frame of your area on the global map using the appropriate tool on the bottom left of the map screen;
- To use **free coordinates**, type the lat-long geographic references in the appropriate fields around the map screen, without any limitation of decimal figures;
- To use the coordinates of a **predefined region**, select the region from the drop-down list.

Whatever type of geographic search you decide to perform, in the **Spatial search type** field, you can choose from different options: **is**, **overlaps**, **encloses**, **is fully outside of**. If you use this field, be cautious as this limits your output data as follows:

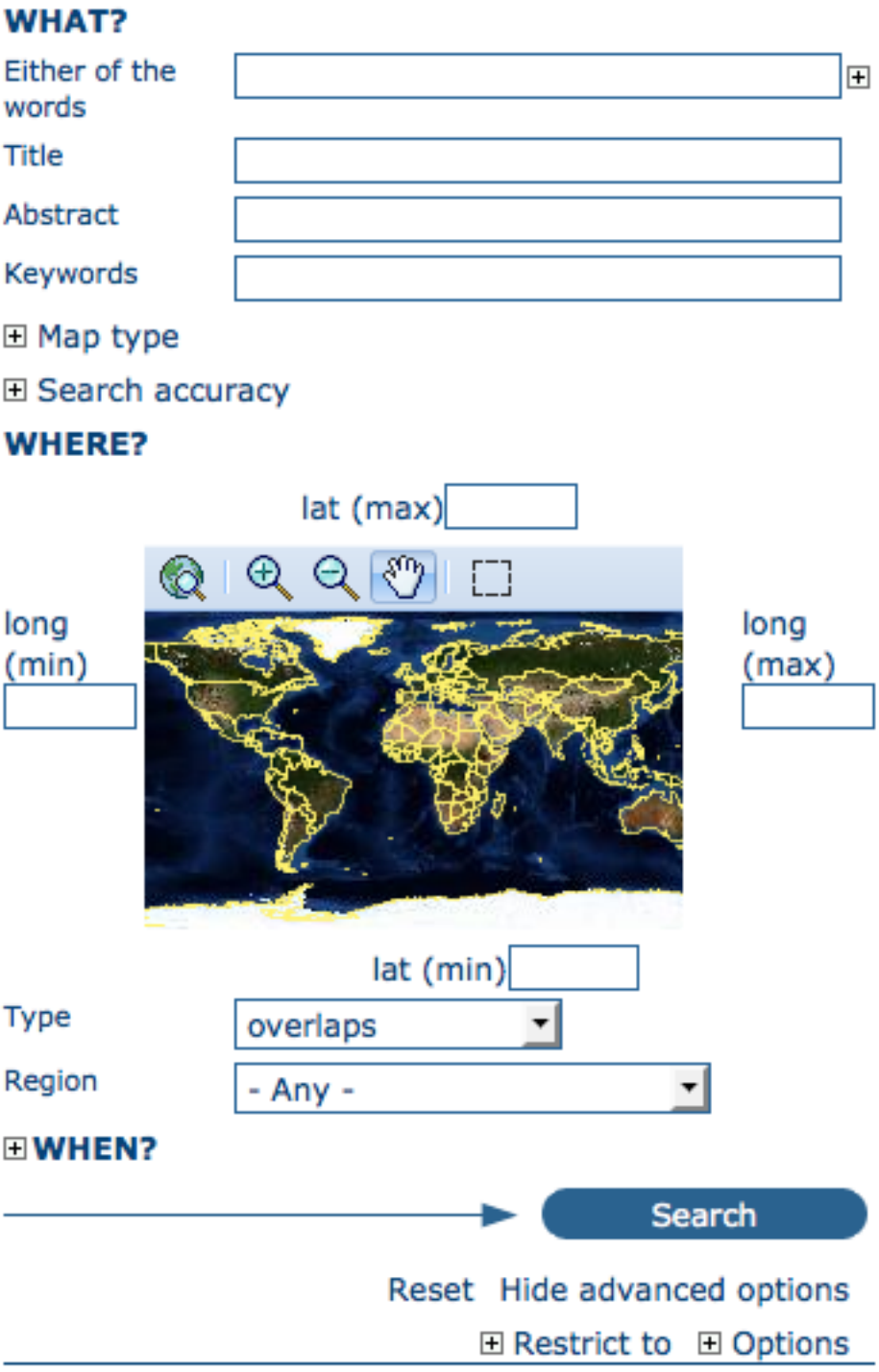



Figure 2.6: *Advanced search options*

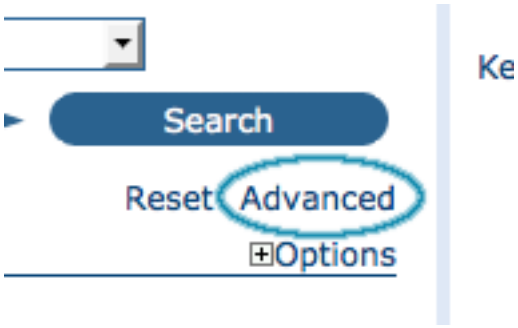



Figure 2.7: *Show advanced search options*

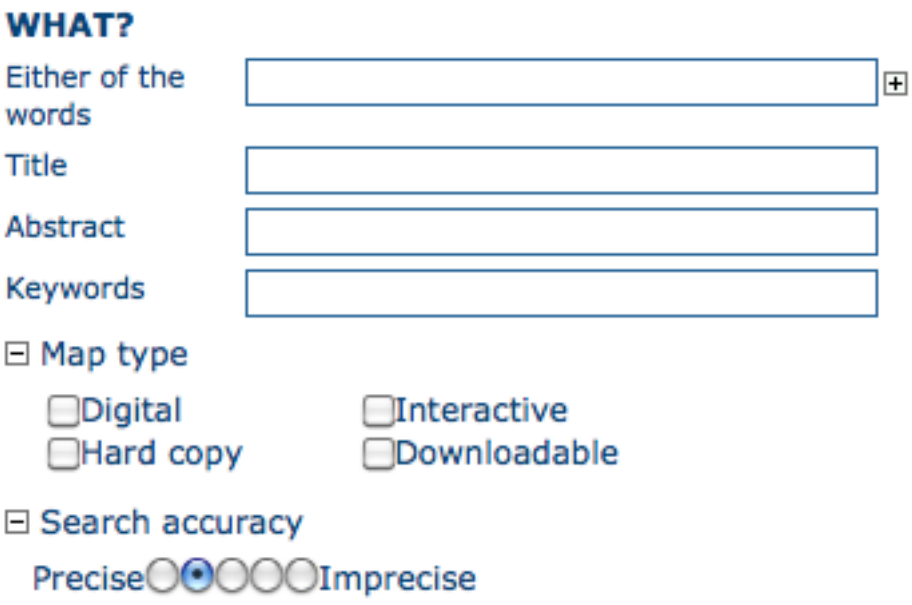



Figure 2.8: *"What" section in the Advanced search*

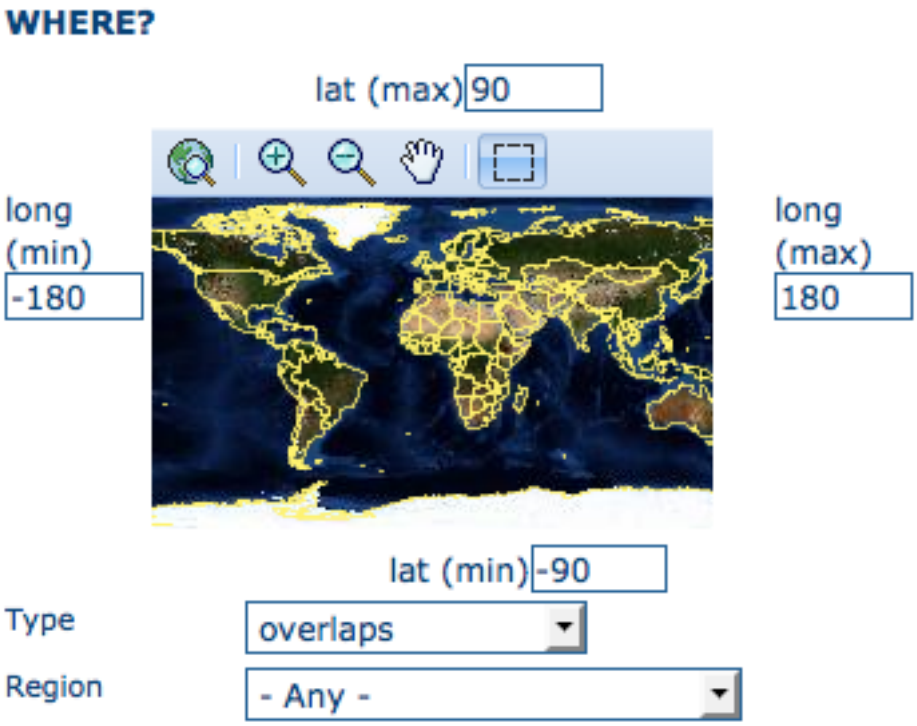



Figure 2.9: *"Where" section in the Advanced search*

- If you choose **Spatial search type** *is* "Country", only maps for the selected country will be displayed. In other words, a city map within that country will not show in the output results.
- If you choose **Spatial search type** *overlaps* "Country", all maps with the bounding box overlapping that country will be displayed in the results, i.e. the neighbouring countries, the continent of which that country is part of and the global maps.
- If you choose **Spatial search type** *encloses* "Country" you will get, in the output results, maps of that country first and then all maps within its bounding box.
- Similarly, if you choose **Spatial search type** *is fully outside of* a selected region, only maps that follow that exact criteria will show in the output results.

The **WHEN?** section gives you the possibility to restrict your search in terms of temporal extent, indicating a specific range of time referred to the data creation or publication date.

- To specify a range of time, click on the date selector button next to **From – To** fields. Make use of the symbols **>** and **>>** on top of the calendar to select the month and the year first and then click on the exact day; a complete date will be filled in using the following standard order: YY-MM-DD.
- To clean the time fields, simply click on the white cross on their right; the box **Any** will be automatically selected and the search will be performed without any restriction on the time period.

Finally, the advanced search allows you to apply further restrictions on the basis of additional parameters as data source, data categories and data format.

- To limit your queries to only one **Catalogue** out of those made available by the installation through the harvesting process, highlight the catalogue of preference or just keep **Any** selected to search all sites.
- To search for data organised by **Category**, such as Applications, Datasets, etc., simply highlight the category you wish to search in from the related drop-down list, otherwise we suggest to leave

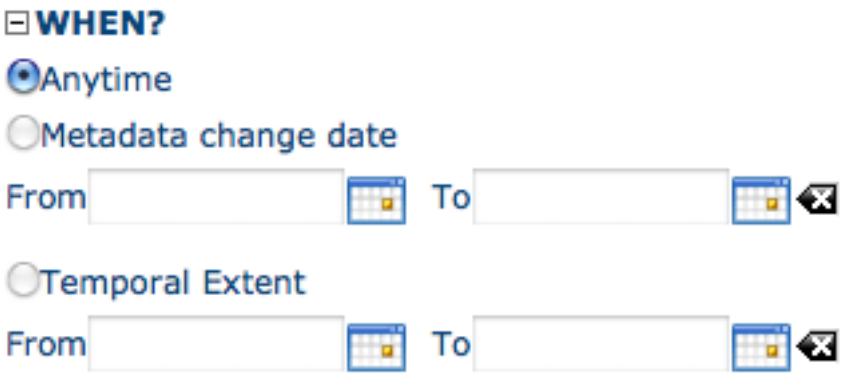



Figure 2.10: *"When" section in the Advanced search*

this field in **Any** Category.

- You can search for **Digital** or **Hard Copy** maps. To search in one or the other, simply check the box next to the one you wish to search. If no box is checked, all content will be searched.

At last, you can customise the number of output results per page in the *Hits Per Page* field. Simply highlight the number of records to be displayed or leave the field set on the default number (10).

- Click the **Search** button.

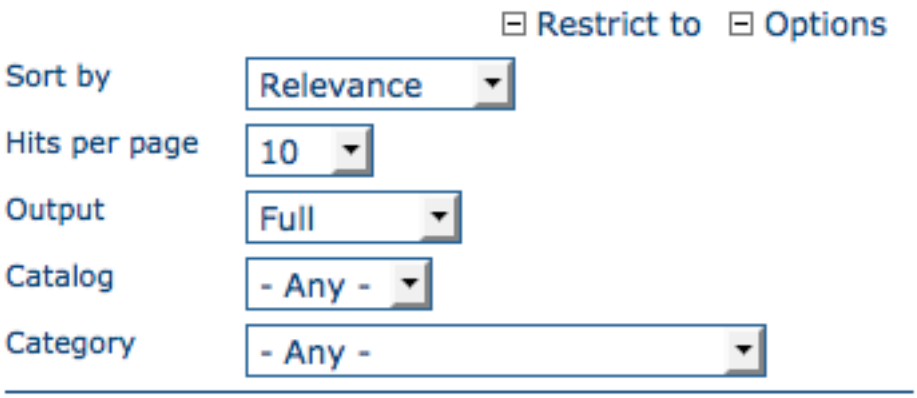



Figure 2.11: *Other options in the Advanced search*

### 2.2.4 Search Results

The output of a search provides you a list of the metadata records that should fit your request. For each record, the result page shows the title, an abstract and the keywords. According to the privileges that have been set for each metadata, a maximum of four sections can be consulted, as shown below.

1. **Metadata**: The metadata section describes the dataset (e.g.: citation, data owner, temporal/spatial/methodological information) and could contain links to other web sites that could provide further information about the dataset.
2. **Download**: Depending on the privileges that have been set for each record, when this button is present, the dataset is available and downloadable. The process for retrieving data is simple and

GeoNetwork opensource
Geographic data sharing for everyone
Home | Contact us | Links | About | Help |
Username
Password
Login
WHAT?
WHERE?
Search
Reset
Advanced
Options
Applications
Audio/Video
Case studies, best practices
Conference proceedings
Datasets
Directories
Interactive resources
Maps & graphics
Other information resources
Photo
GeoRSS
Geoscience Australia's Open Day Photographs 26th August 2007
Localities in Victoria (VMADMIN.LOCALITY_POLYGON) - Comprehensive Elements
Hydrological Basins in Africa (Sample record, please remove!)
Physiographic Map of North and Central Eurasia (Sample record, please remove!)
Hydrological basins in Europe
Globally threatened species of the world
Natural polar ecosystems
Show map
FIND INTERACTIVE MAPS, GIS DATASETS, SATELLITE IMAGERY AND RELATED APPLICATIONS
Aggregate Results matching search criteria : 1-7/7 (page 1/1), 0 selected
Select : all, none
actions on selection
Sort by
Relevance
HYDROLOGICAL BASINS IN AFRICA (SAMPLE RECORD, PLEASE REMOVE!)
Abstract
Major hydrological basins and their sub-basins. This dataset divides the African continent according to its hydrological characteristics. The dataset consists of the following information:- numerical...
Keywords
watersheds, river basins, water resources, hydrology, AQUASTAT, AWRD, Africa
Metadata
Download
Interactive Map
PHYSIOGRAPHIC MAP OF NORTH AND CENTRAL EURASIA (SAMPLE RECORD, PLEASE REMOVE!)
Abstract
Physiographic maps for the CIS and Baltic States (CIS_BS), Mongolia, China and Taiwan Province of China. Between the three regions (China, Mongolia, and CIS_BS countries) DCW boundaries were introduc...
Keywords
physiography, soil, Eurasia
Metadata
Download
Interactive Map
LOCALITIES IN VICTORIA (VMADMIN.LOCALITY_POLYGON) - COMPREHENSIVE ELEMENTS
Abstract
This dataset is the definitive set of locality boundaries for the state of Victoria as defined by Local Government and registered by the Registrar of Geographic Names. The bound...
Keywords
BOUNDARIES-Administrative, LAND-Ownership
Metadata
No preview available

Figure 2.12: *Search results*

quick by just clicking the download button or by using the proper link in the specific metadata section for distribution info in the full metadata view.

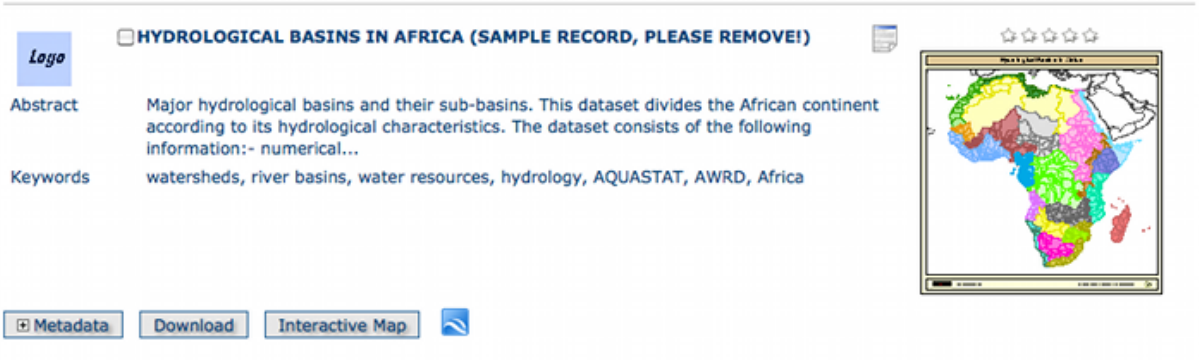

Logo
HYDROLOGICAL BASINS IN AFRICA (SAMPLE RECORD, PLEASE REMOVE!)
Abstract
Major hydrological basins and their sub-basins. This dataset divides the African continent according to its hydrological characteristics. The dataset consists of the following information:- numerical...
Keywords
watersheds, river basins, water resources, hydrology, AQUASTAT, AWRD, Africa
Metadata
Download
Interactive Map

Figure 2.13: *A single search result*

Figure 2.14: *Available services related to the resource*

3. **Interactive Map**: The map service is also optional. When this button is shown, an interactive map for this layer is available and, by default, it will be displayed on the map screen of the simple search. To better visualise the map through the map viewer, **click** on **Show Map** on the top of search results panel.

4. **Graphic Overviews**: There are small and large overviews of the map used to properly evaluate usefulness of the data, especially if the interactive map is not available. Simply click on the small image to enlarge it.

### 2.2.5 Privileges, roles and user groups

GeoNetwork uses a system of *Privileges*, *Roles* and *User groups*.

There are no restrictions for users to search and access **public information** in a GeoNetwork opensource based catalogue. To get access to **restricted information** or advanced functionality, an account to log in is required. This should be provided by the GeoNetwork administrator.

To log in, simply go to the home page and enter your username and password in the dedicated fields on the top right corner, then click the login button.

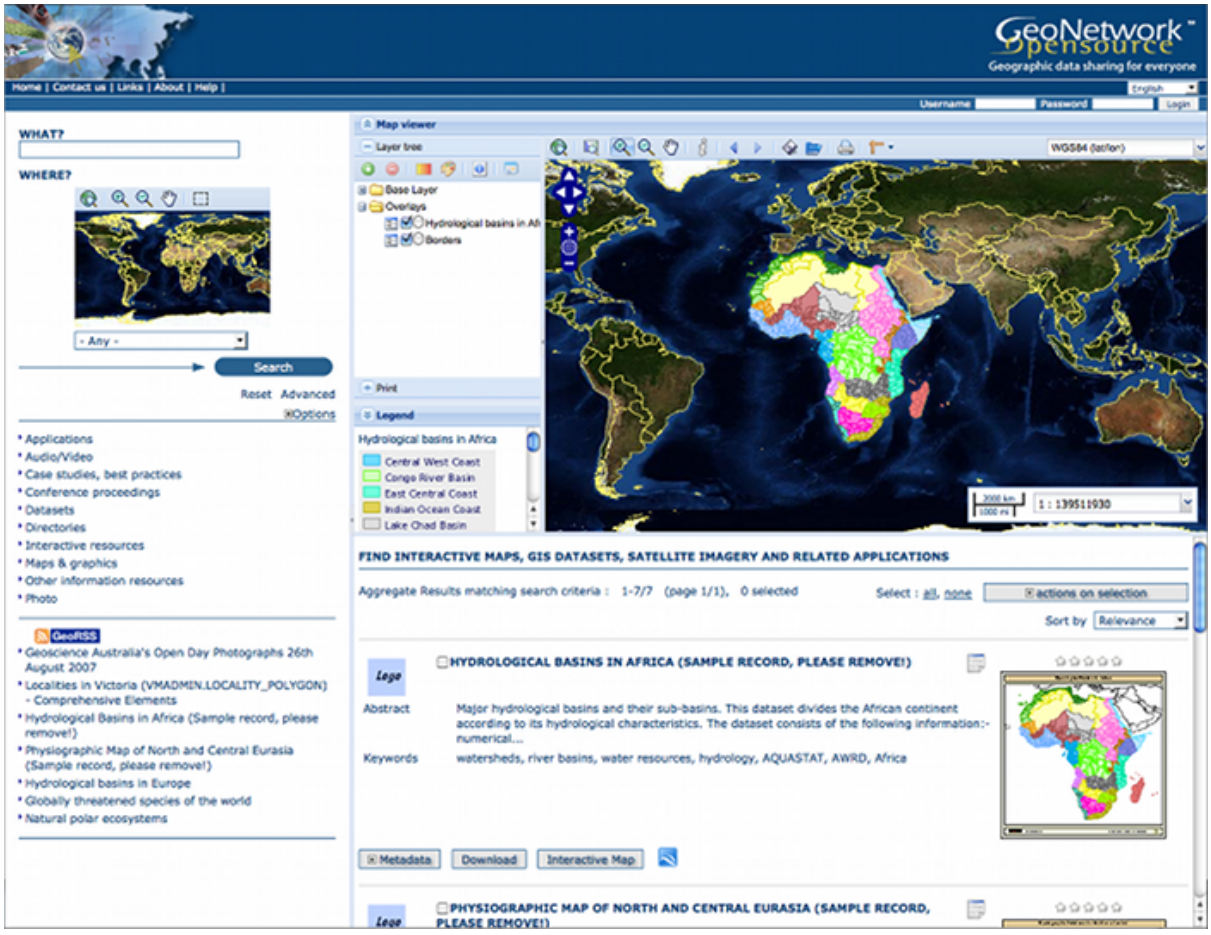



Figure 2.15: *The interactive map viewer*

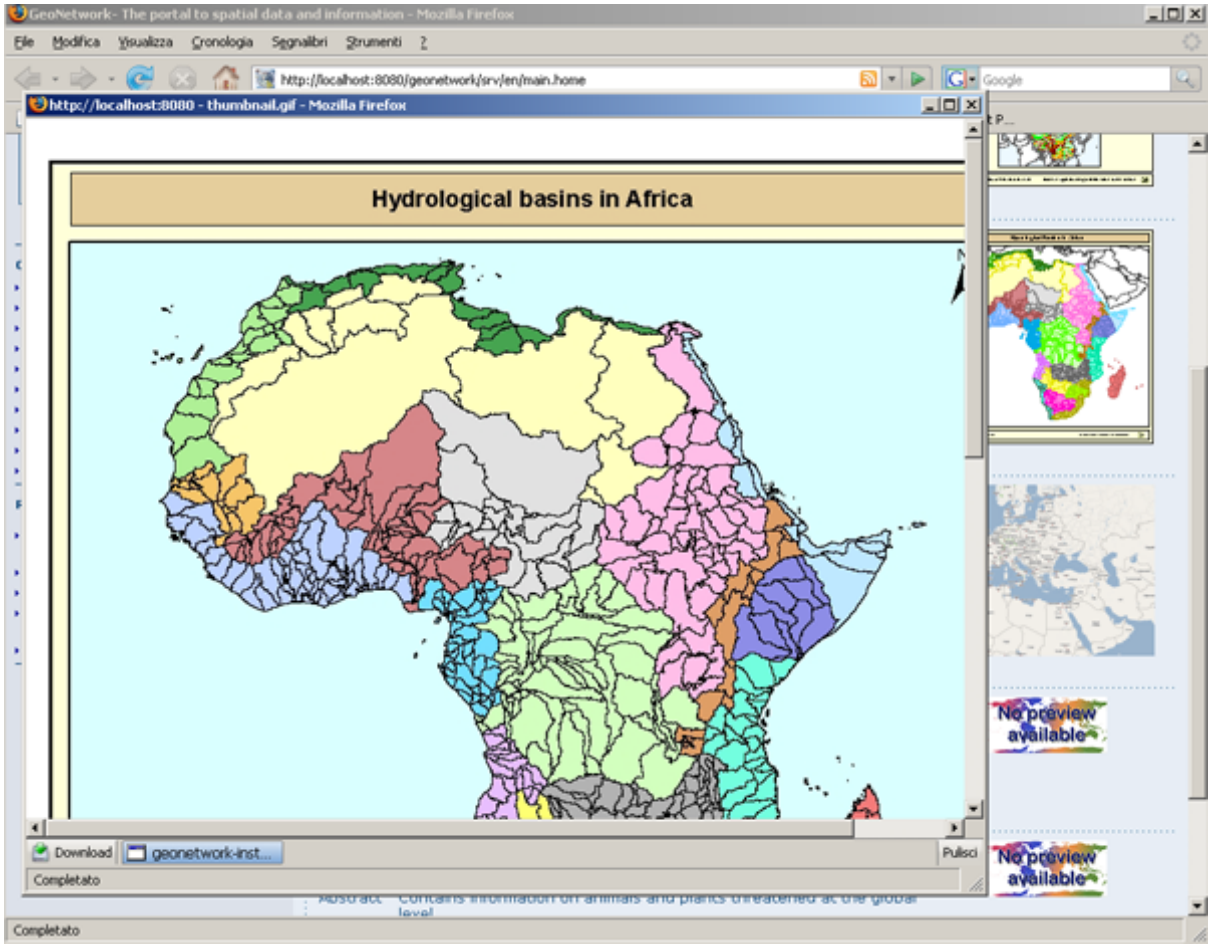



Figure 2.16: *Large preview image*

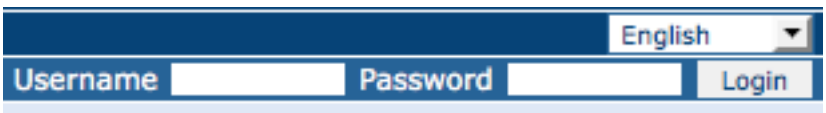



Figure 2.17: *Login*

**Privileges.** Depending on the privileges set on a metadata record and on your role as an authenticated user, you will be able to read about a resource and download or interactively browse data related to that resource.

**Roles.** Users with an *Editor* role can create, import and edit metadata records. They can also upload data and configure links to interactive map services.

**User groups.** Every authenticated user is assigned to a particular work group and is able to view data within that work group.

## 2.3 Viewing and Analysing the Data

Once you have completed your search, you view details of a particular record by clicking on the *Metadata* button.

The metadata profiles used by GeoNetwork opensource to present and describe geographic data and general documents stored in the catalogue are based on the *International Standard ISO 19115:2003*, encoded according to the *implementation schema 19139:2007*, the *FGDC* and the international standard *Dublin Core*.

In this guide the *ISO 19139* metadata implementation will be described in details since it is also suggested as profile for the creation of new metadata records.

### 2.3.1 Metadata Description

The metadata ISO 19139 profile used by GeoNetwork opensource to describe the geographic data and services is based on the ISO standard 19115:2003 and provides information related to the identification, the maintenance and constraints, the spatial and temporal extent, the spatial representation and reference, the quality and distribution of a geographic dataset.

The metadata profile is organised in sections and the most important, illustrated in *main_sections*, are the: *Identification Section, Distribution Section, Reference System Section, Data Quality Section and Metadata Section*. These sections are described here in details.

#### Identification Section

This section includes information on the citation of the resource (*title, date of creation or publication, edition, presentation form*), the *abstract*, the *purpose* and the present*status* of the resource that can be defined among the options: completed, historical archive, obsolete, ongoing, planned, required or under development.

This section also contains information about the person or organisation responsible for the data and who is considered to be a *point of contact* for the resource i.e. the dataset owner, originator, distributor, publisher, etc. and it provides information on *data maintenance* i.e. annually, monthly, daily, not planned, as needed, etc.

Elements for *keywords* and for describing restrictions on *data access* and *use* are also included in this section in addition to *spatial representation info* like data type (vector, raster, text table, etc.)

The identification section provides information about the *scale*, the *language* and *character set* used within the resource and the list of *ISO categories* through which your map could be classified.

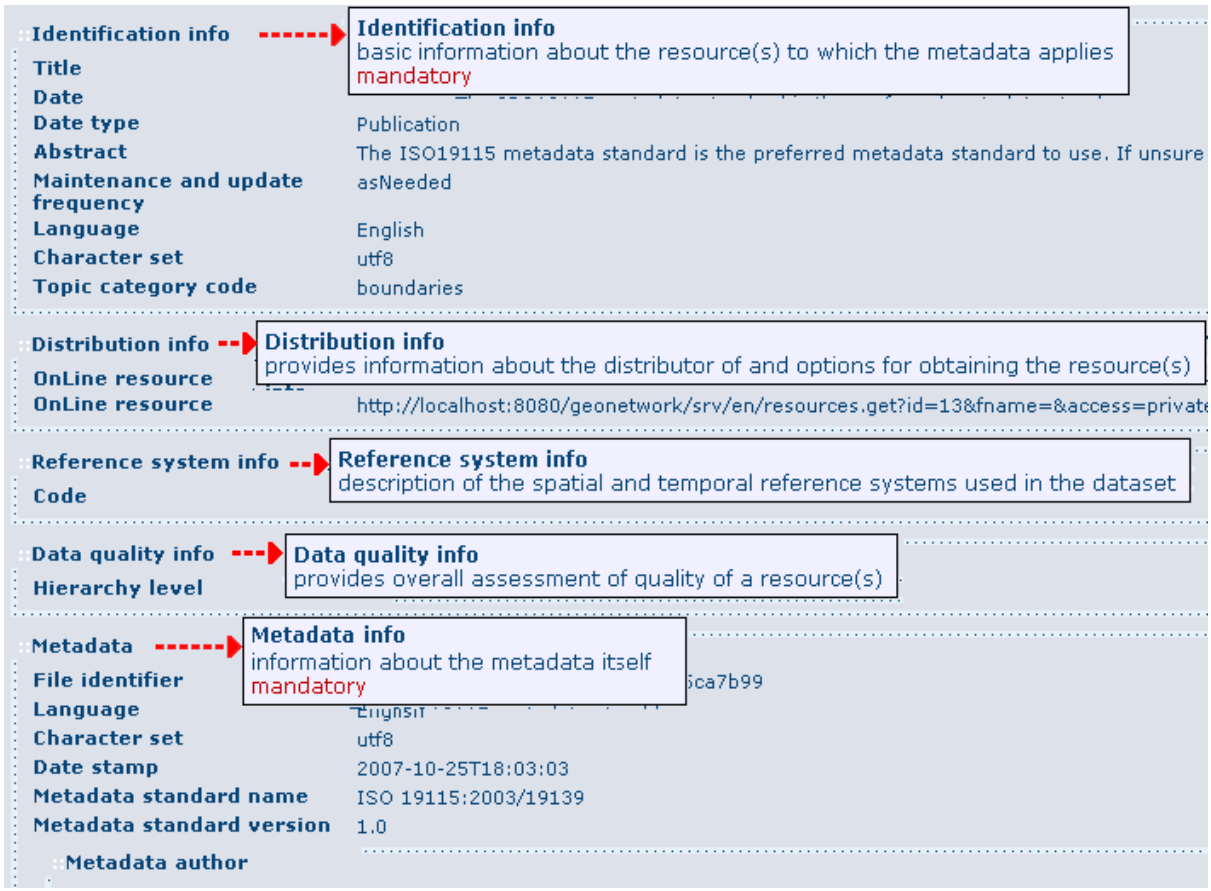



Figure 2.18: *Main metadata sections*

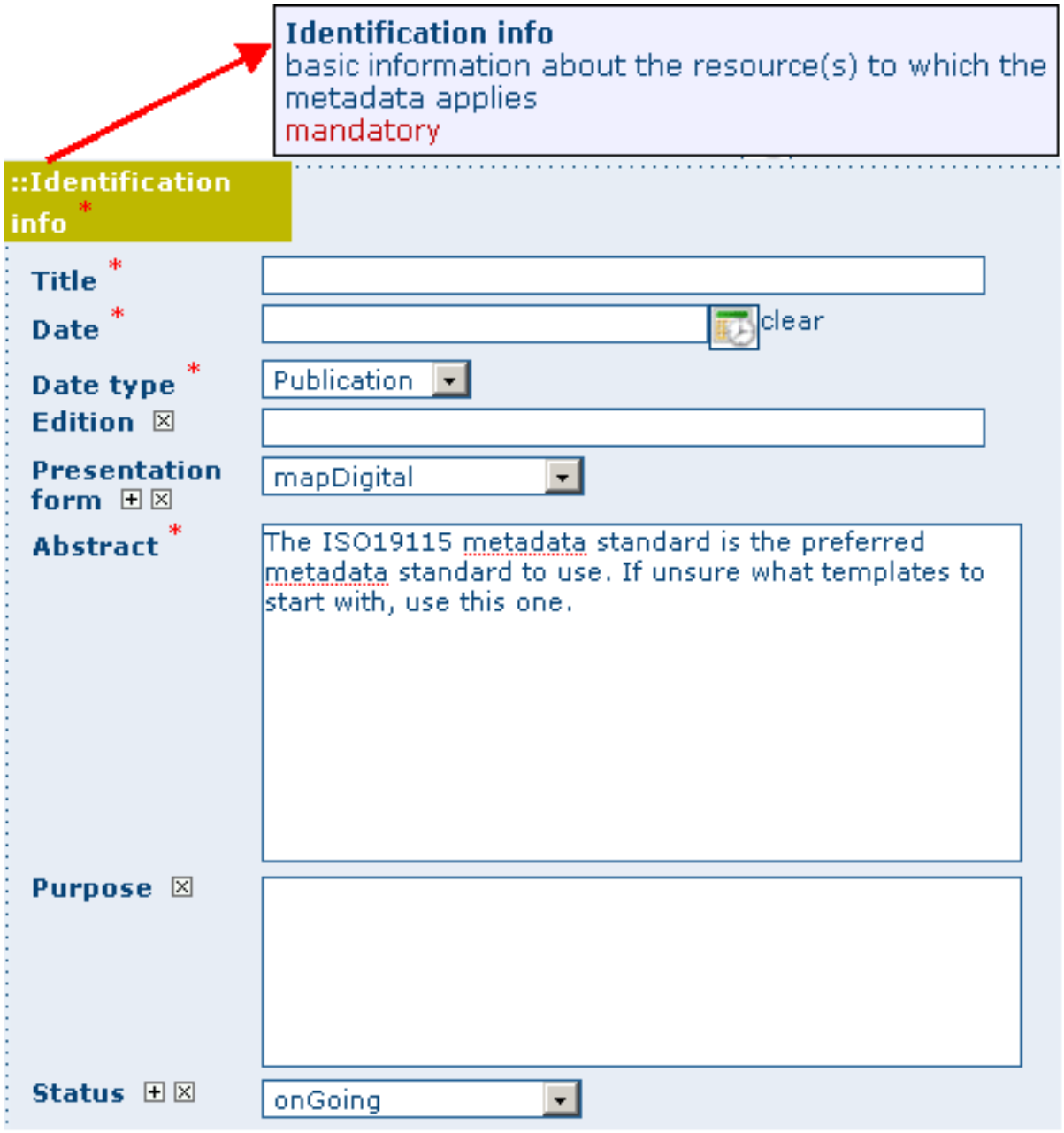



Figure 2.19: *Identification information*

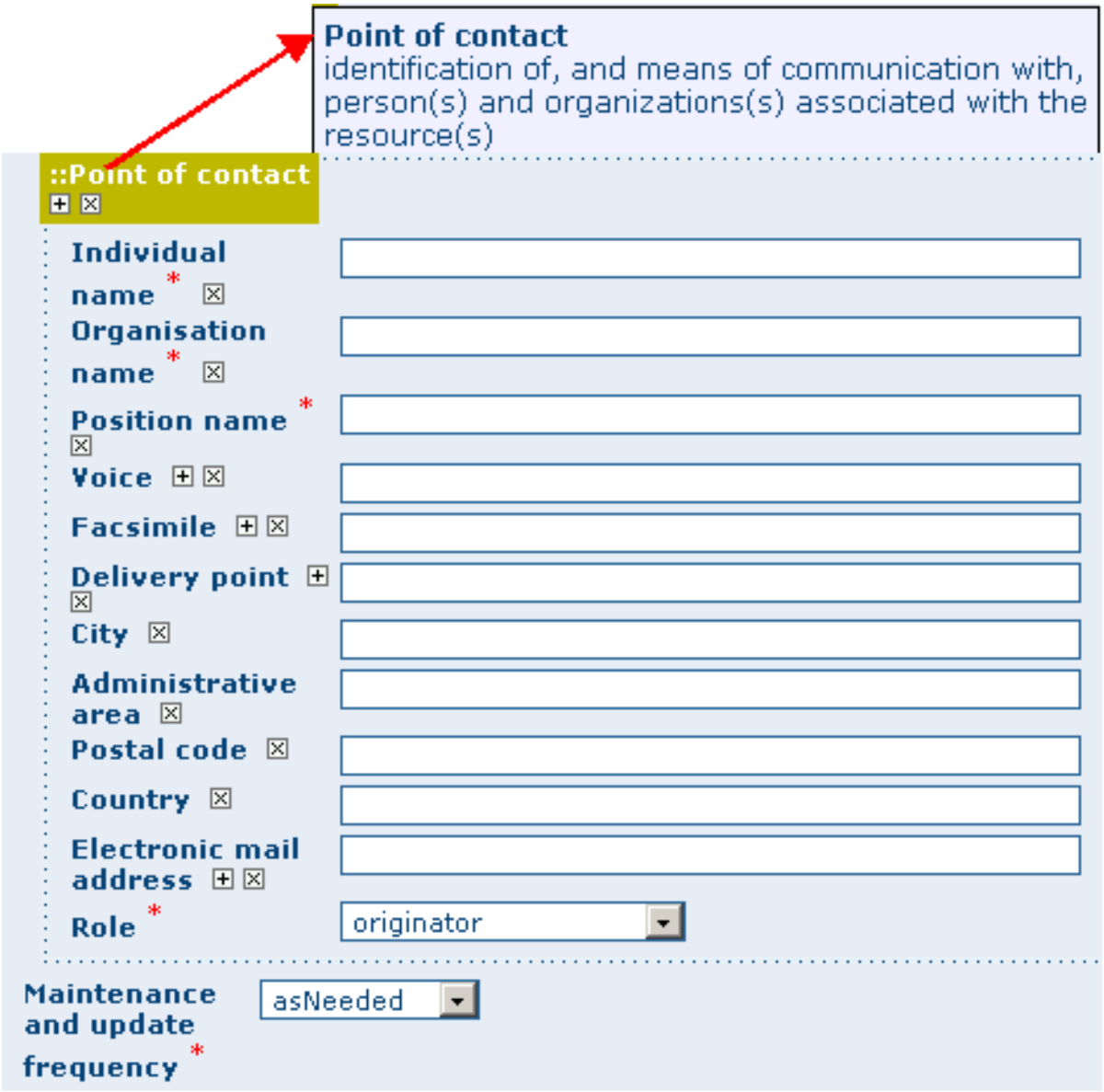



Figure 2.20: *Point of Contact*

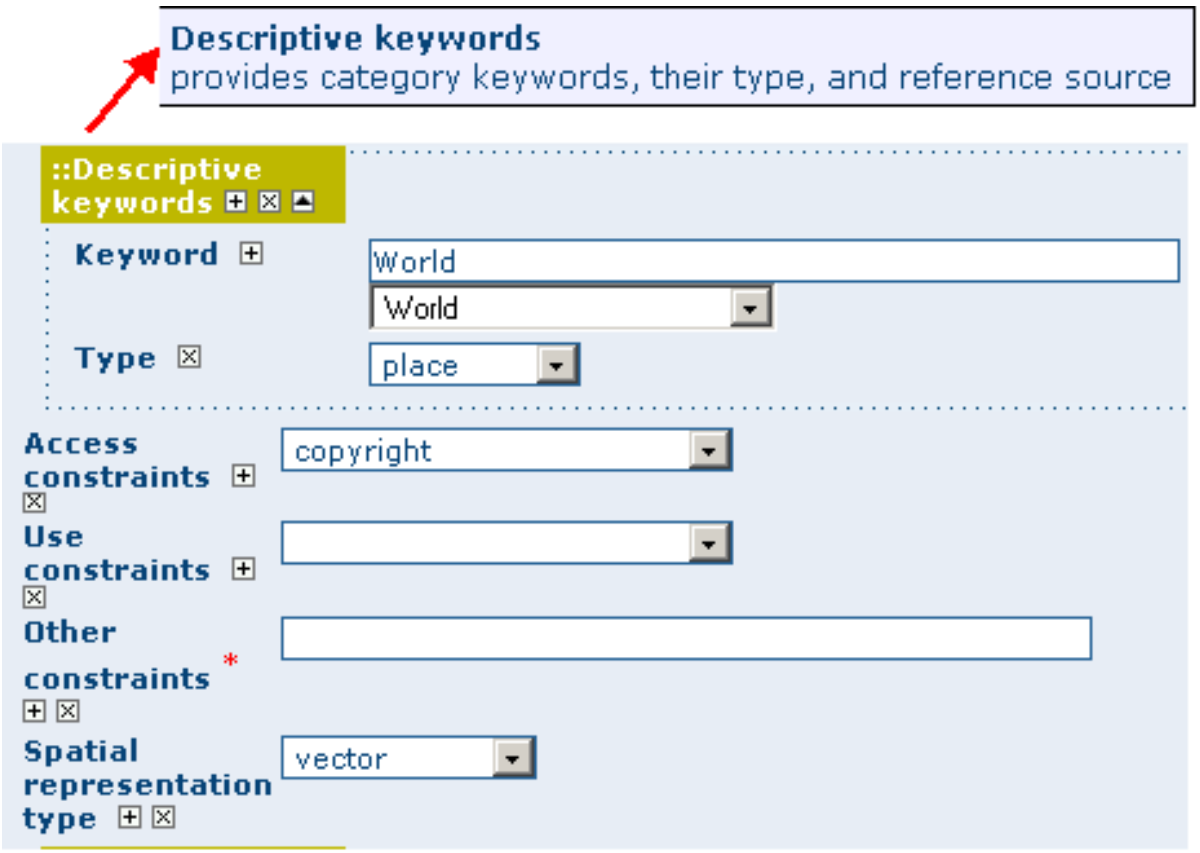



Figure 2.21: *Descriptive keywords*

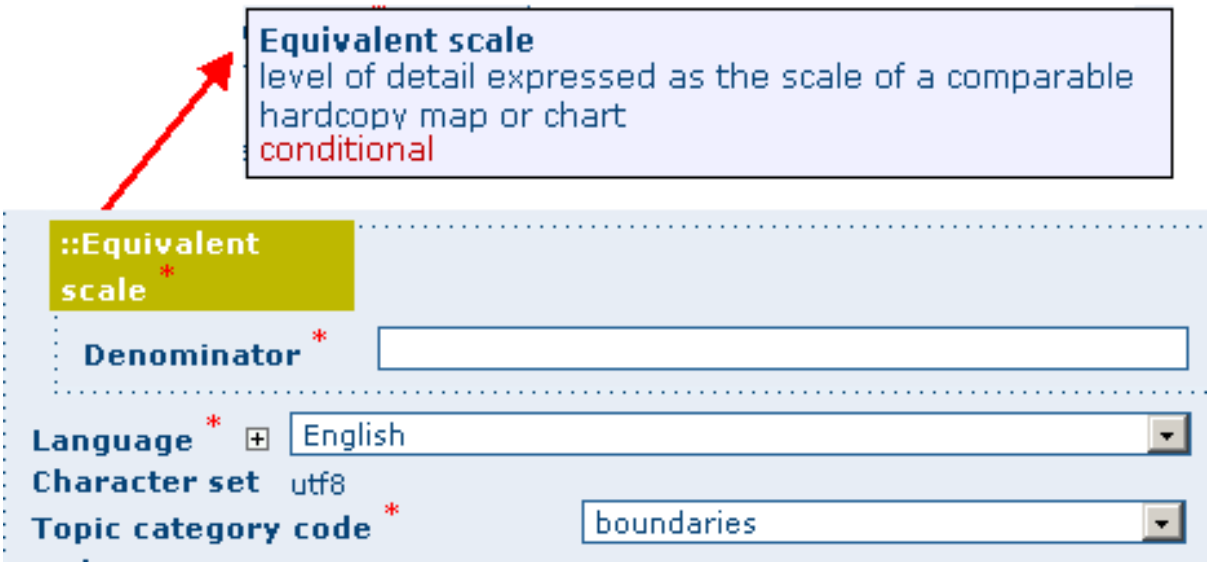



Figure 2.22: *Scale and other data properties*

Finally, the temporal and spatial extent are also defined in this section. The temporal extent is defined through the starting and ending date of data validation.

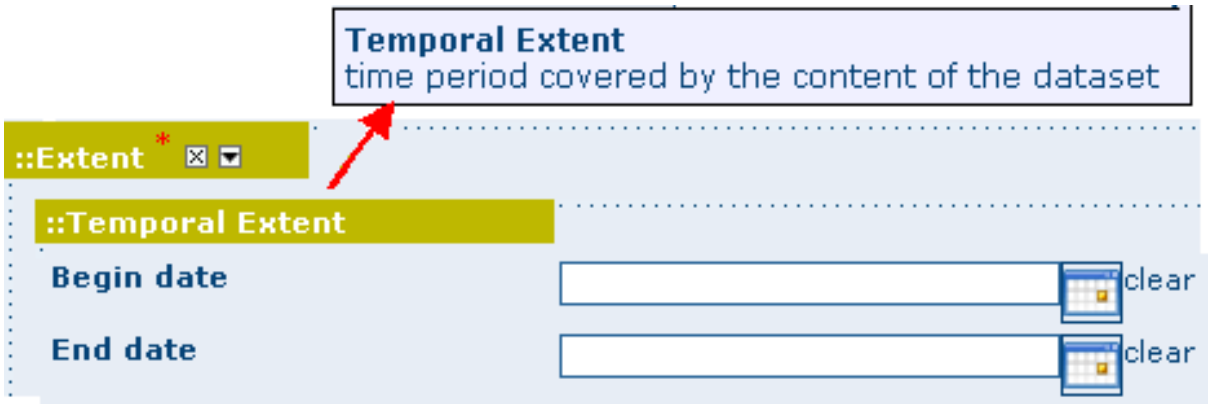



Figure 2.23: *Temporal extent*

The spatial extent of the interested area is defined through geographic coordinates or through the selection of a country or region from a predefined list. Free text *supplemental information* can be added to complete the data identification section.

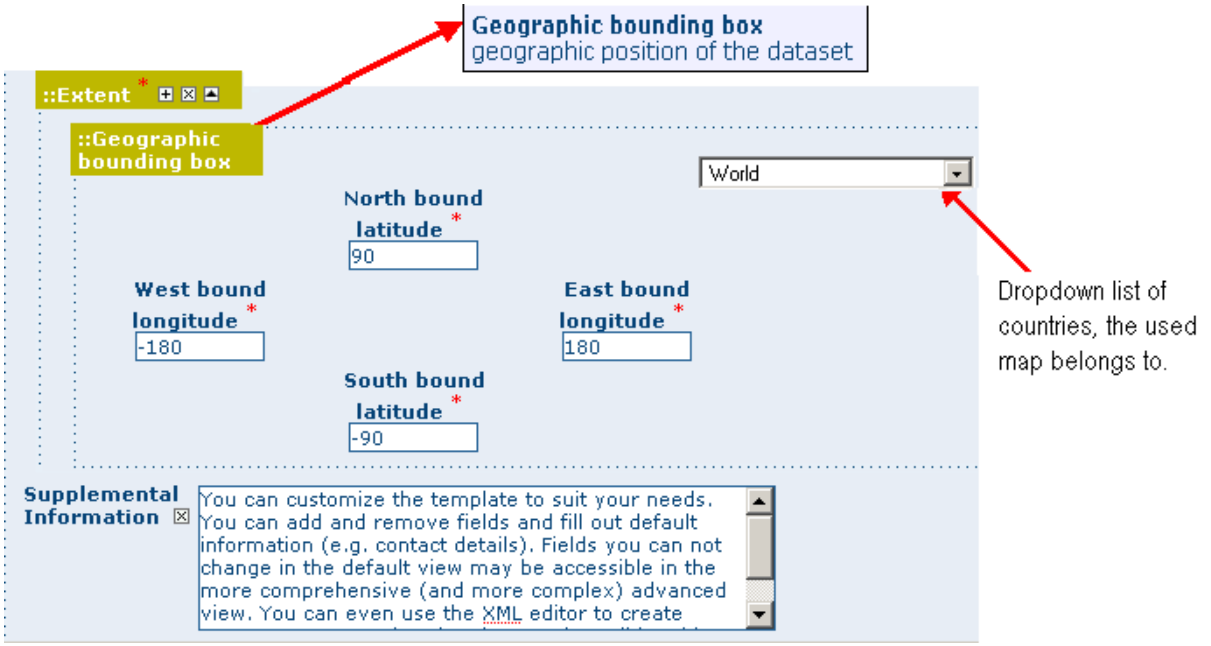

Geographic bounding box
geographic position of the dataset
::Extent *
::Geographic bounding box
World
North bound latitude *
90
West bound longitude *
-180
East bound longitude *
180
South bound latitude *
-90
Dropdown list of countries, the used map belongs to.
Supplemental Information
You can customize the template to suit your needs. You can add and remove fields and fill out default information (e.g. contact details). Fields you can not change in the default view may be accessible in the more comprehensive (and more complex) advanced view. You can even use the XML editor to create

Figure 2.24: *Geographic bounding box*

### Distribution Section

This section provides metadata elements for *accessing* other useful *on-line resources* available *through the web*. The distribution elements allow for on-line access using an URL address or similar addressing scheme and provide the protocol for the proper connection *for accessing geographic data* or any other types of digital documents *using the download function*. Furthermore, it is possible *to link* a metadata with a *predefined map service* through the *online resource* and see the map interactively.

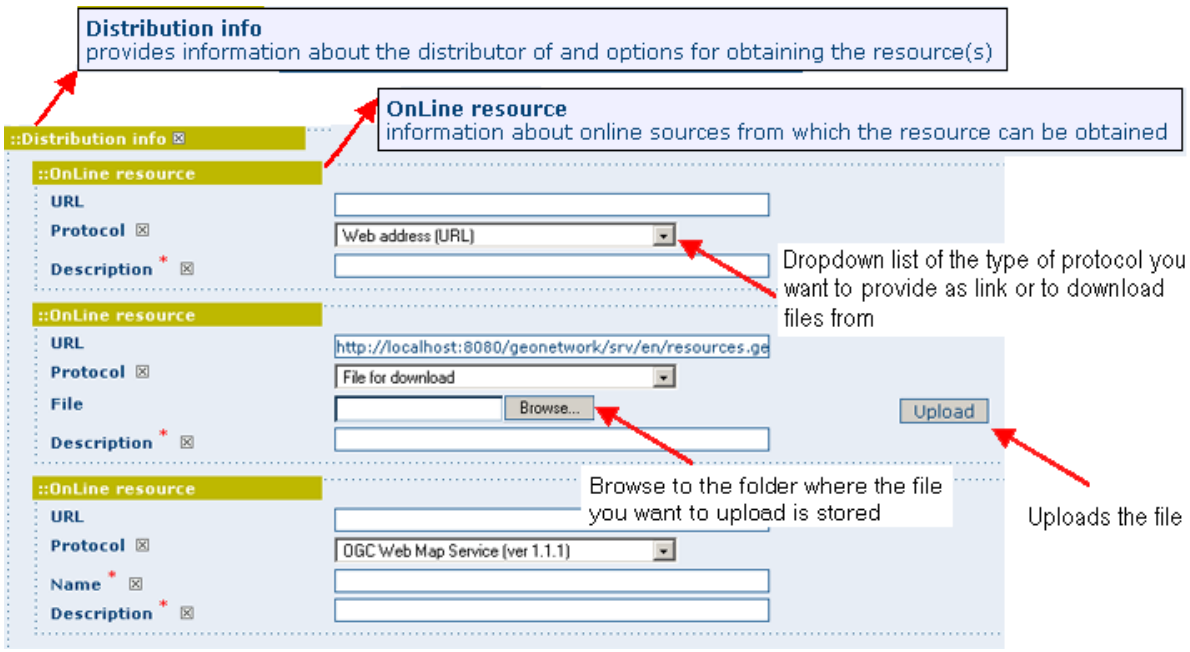



Figure 2.25: *Distribution information*

### Reference System Section

The Spatial Reference System section *defines metadata* required *to describe* the *spatial reference system* of a dataset. It contains one element to identify the name of the reference system used. Using elements *from the advanced form*, this section may be modified to provide more *details* on *data projection*, *ellipsoid* and *datum*. Note that if this information is provided, a reference system identifier is not mandatory.

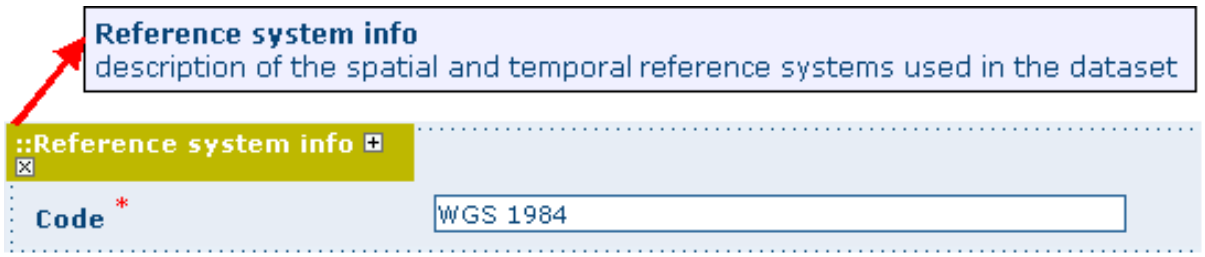

Reference system info
description of the spatial and temporal reference systems used in the dataset
::Reference system info
Code
WGS 1984

Figure 2.26: *Reference system*

### Data Quality Section

The Data Quality section provides a *general assessment* of the *quality of the data*. It describes the*different hierarchical levels of data quality*, namely a *dataset series*, *dataset*, *features*, *attributes*, etc. This section also contains information about *sources of the input data*, and a *general explanation of the production processes* (lineage) used for creating the data.

### Metadata Information Section

This section contains information about the metadata itself: the Universally Unique Identifier (UUID) assigned to the record (this is the 'File identifier'), *language* and *characterset* used, *date* of *last edit*

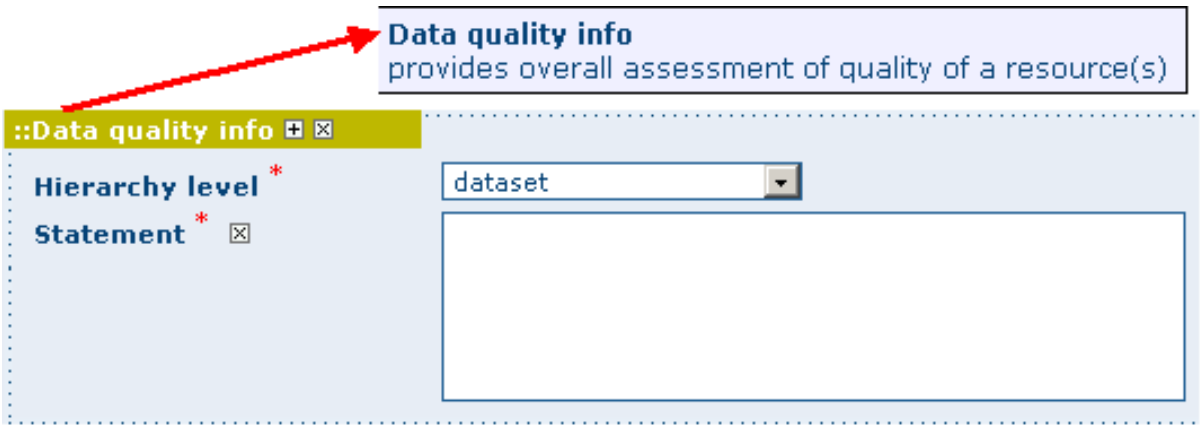



Figure 2.27: *Data quality*

('Date stamp') and the *metadata standard* and *version name* of the record. It also contains information on the *metadata author* responsible for the metadata record; this person can also be a point of contact for the resource described. Information on the Metadata author is mandatory.

## 2.4 Adding new Data and Information

This section guides you through the process of adding new records (new data with information) into the GeoNetwork catalogue using either the online metadata editor or the advanced metadata insert tool, based on XML documents. In both cases you will use the template system, add thumbnails, upload data, link to services and set access privileges to the metadata and data.

To add or edit data and metadata, you must be **registered** as an **Editor** into the work group you want to add records to. Contact your administrator if you are not a registered editor for your work group.

For the metadata creation using the online editor, GNos provides a set of simplified metadata templates based on the cited standards: ISO, FGDC and DC. The templates for vector and raster based on the ISO 19139 are the preferred ones since they are devised in a way that hides the complexity of the ISO19115 standard in the default view. At the same time those templates are extensible with new elements to fit specialized needs through the advanced view.

To produce a good metadata record, always try to gather as much details as possible on the resource that you want to describe taking into account the metadata elements that have been presented in the previous chapter. The next step is to fill out properly the fields provided by the metadata templates, while at the same time avoiding duplication of information throughout the form.

The most important fields that may not be waived while compiling a standard based metadata record are the following: **Title, Date of Creation o Publication, Abstract, Language used for documenting data, Topic Category, Scale, Maintenance and Update Frequency, Metadata Author, Language Used for Documenting Metadata.**

In addition to the main mandatory fields, we recommend you to fill out these optional but critical fields (if information is available): **Purpose - Keywords - Presentation Form - Status - Spatial Representation Type - Geographic Location - Reference System Info - Temporal Extent - Data Quality Info - Access and Use Constraints - Point of Contact - Distribution Info: Online Resources.**

*You should also prepare an image of your data that is required to be displayed in search results as thumbnail.*

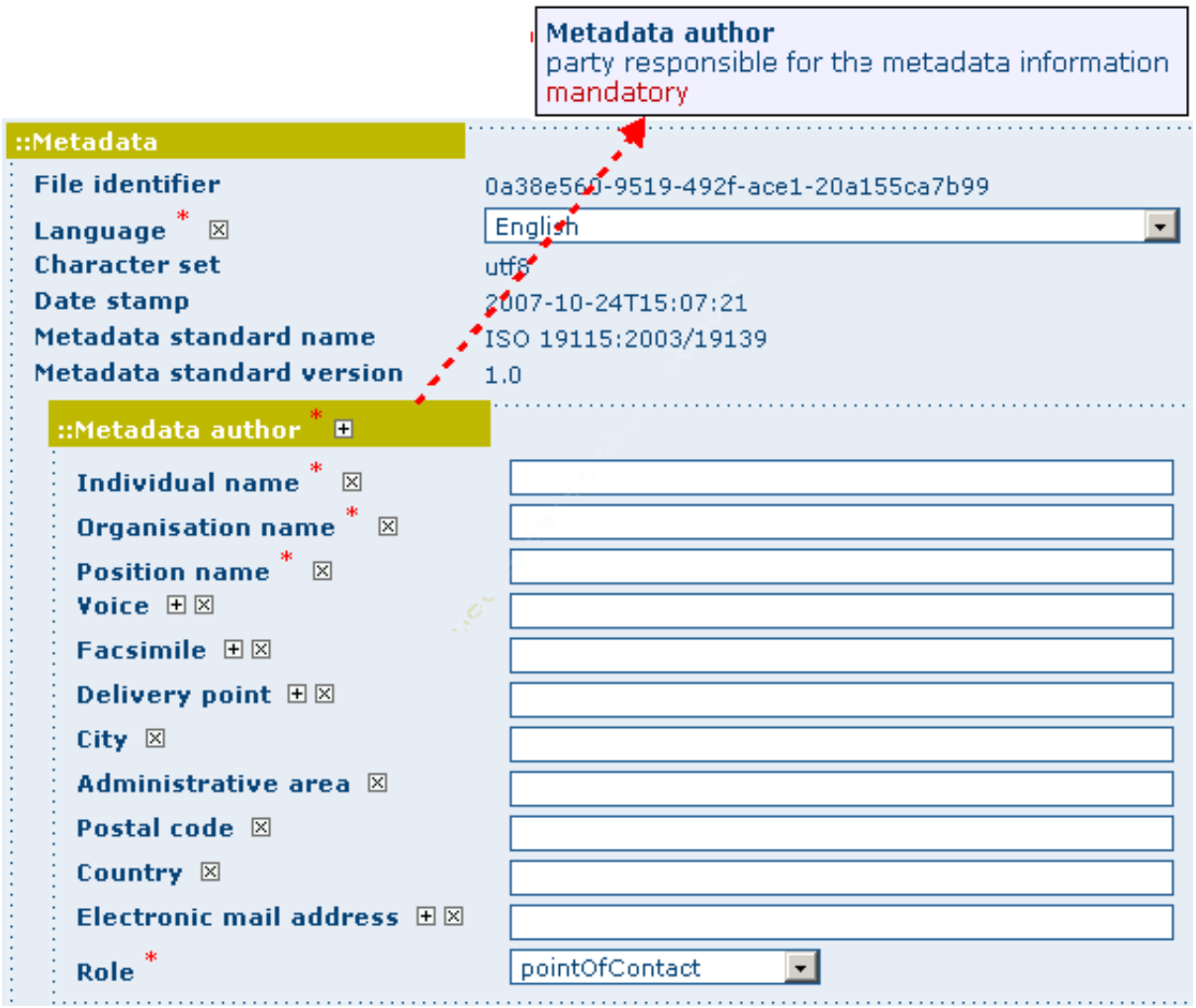



Figure 2.28: *Metadata properties*

*Next section will guide you through the process of metadata creation using the online editor.*

### 2.4.1 Creating a New Record using the web based Metadata Editor

1. In the home page, click on the **Administration Tab**.
2. Select **New Metadata** from the List of the admin page.
3. Select the metadata standard **Template**, if possible, using the preferred ones. GeoNetwork opensource comes by default with support for three metadata standards, ISO19139, FGDC and Dublin core. For the ISO standard, two templates have been developed; one for vector and one for raster data. Both contain a relevant set of elements to describe the respective types of data. More templates can be developed online.
4. Select the **Group** the metadata will belong to. These are the groups authorized to add metadata to by your administrator.
5. Click on **Create**.

### 2.4.2 The steps in more details

1. Enter your username and password and click on the login button. The system will identify you and assign the correct privileges to work with.

Figure 2.29: *Login*

2. Open the Administration page by clicking the Administration button in the banner and then click on the New metadata link.

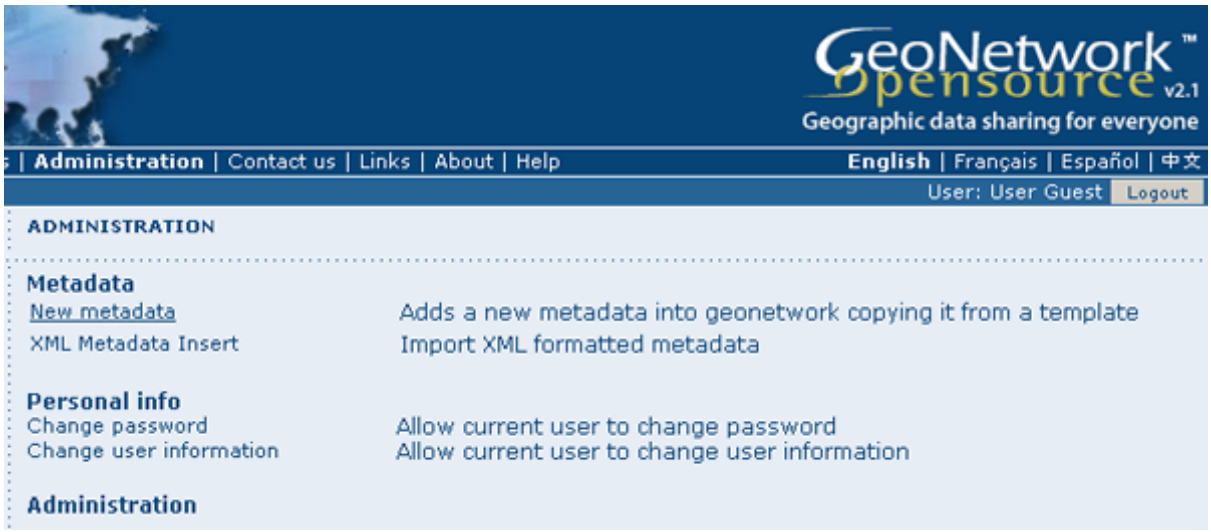



Figure 2.30: *Administration panel*

3. From the metadata creation page, select the metadata standard to use from the dropdown list (Figure 4.3, "Template selection")

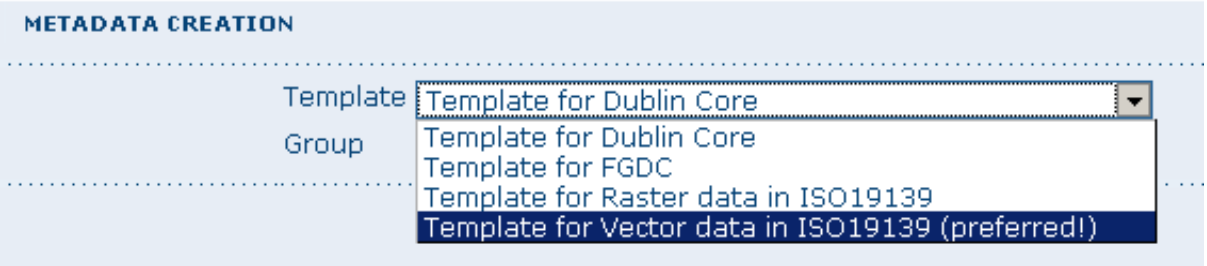



Figure 2.31: *Template selection*

4. After selecting the correct template, you should identify which group of users the metadata will belong to and finally click on **Create**.

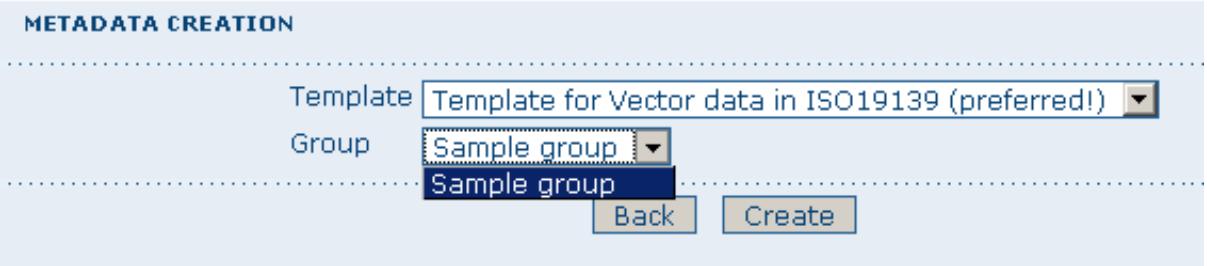



Figure 2.32: *Group selection*

5. A new metadata form based on the selected template will be displayed for you to fill out.

### 2.4.3 Switching Editing Views from Default to Advanced to XML View

Once you create a new record, you can choose between **Default, Advanced** or **XML View**. To switch view, simply click on the view you want to switch to on the left column of the page. The view in **bold** is the view you are currently using.

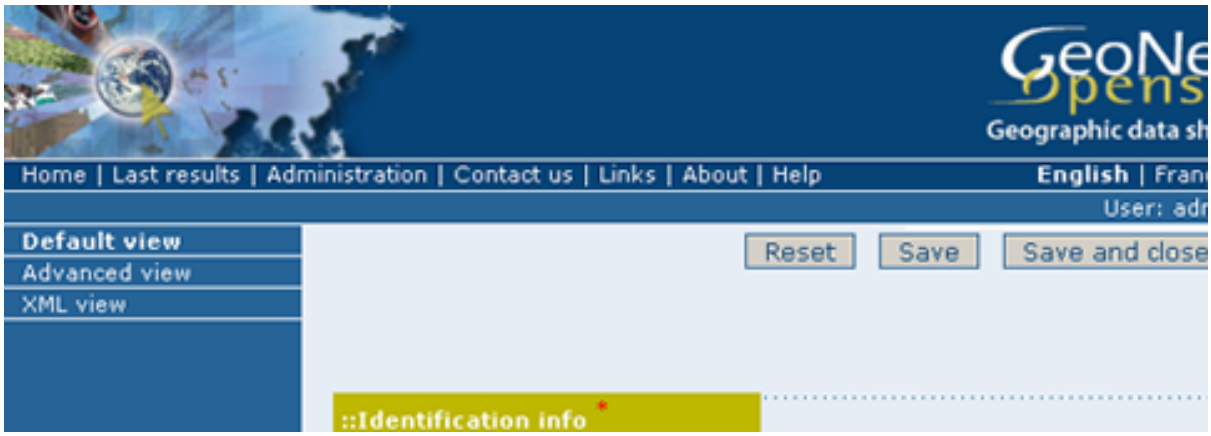



Figure 2.33: *Metadata view options*

In the previous chapter you have analyzed the metadata structure as it is presented in the **Default View**. A selection of the main fields from different categories of information is shown in one single view. The minimum set of metadata required to serve the full range of metadata applications (data discovery, determination of data fitness for use, data access, data transfer and use of digital data) is defined here, along with optional metadata elements to allow for a more extensive standard description of geographic data, if required. However, if should be there a need to add more metadata elements, you can switch to the advanced view at any time while editing.

In the **Advanced View**, the ISO profile offers the possibility to visualize and edit the entire metadata structure organized in sections accessible through tabs from the left column. You can use this view to write more advanced metadata descriptions or templates to fit specialized needs.

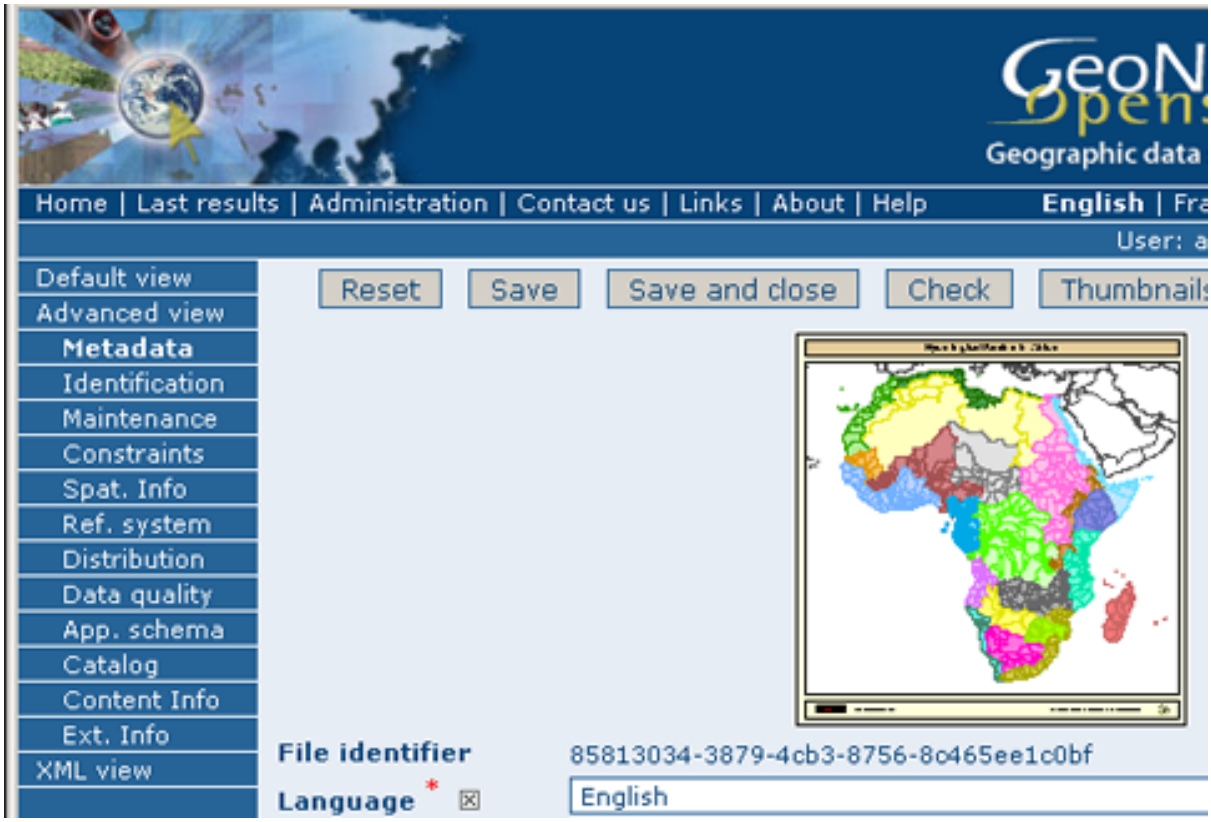



Figure 2.34: *Advanced view*

The **XML View** shows the entire content of the metadata in the original hierarchical structure; different colors allow to distinguish between an element's name and its value. The XML structure is composed of tags and to every tag must correspond a closing tag. The content is entirely contained withing the two, i.e.:

```
<gmd:language>
  <gco:CharacterString>eng</gco:CharacterString>
</gmd:language>
```

Nevertheless, the use of the XML view requires some knowledge of the XML language.

Both the **Default** and the **Advanced Views** are composed of `mandatory`, `conditional` and `optional` metadata fields. The meaning of mandatory and optional is fairly intuitive; the mandatory fields are required, like `Title` and `Abstract` for instance, whereas the optional fields can be provided but are not fundamental, depending on the metadata author. The conditional fields may be considered mandatory under certain circumstances: essentially a conditional requirement indicates that the

Figure 2.35: *XML view*

presence of a specified data element is dependent on the value or presence of other data elements in the same section. For instance, the `Individual name` metadata element of the `Point of Contact`, which is a conditional element of the Identification section, becomes mandatory if another element of the same section, `Organization name` or `Position name` is not already defined.

The **mandatory fields** as well as those **highly recommended** are flagged with **red asterisk [*]**. The standard definition for each field can be read by passing the mouse on the element name.

The **Default View** is the preferred view as it provides a selection of the available metadata elements, facilitating both the user and the editor in reading and editing a metadata record, and at the same time it ensures that a geospatial data can be properly described, through :

- the minimum set of metadata required to serve the full range of metadata applications (data discovery, determination of data fitness for use, data access, data transfer, and use of digital data);
- optional metadata elements - to allow for a more extensive standard description of geographic data, if required;
- a method for extending metadata to fit specialized needs.

### 2.4.4 Using basic commands of the editor

Fields are either **free text fields** or **drop down lists**. Free text means you can type any text into that field. Drop down lists allow you to select only one option from the list. You can add multiple fields of the same kind by clicking on the **[+]** symbol next to the element. Every new field that you will add in the advanced view will then be visible in the default view. You can also delete existing fields by clicking on the **[x]** symbol next to the element. Clearly, mandatory fields cannot be deleted. One example of the

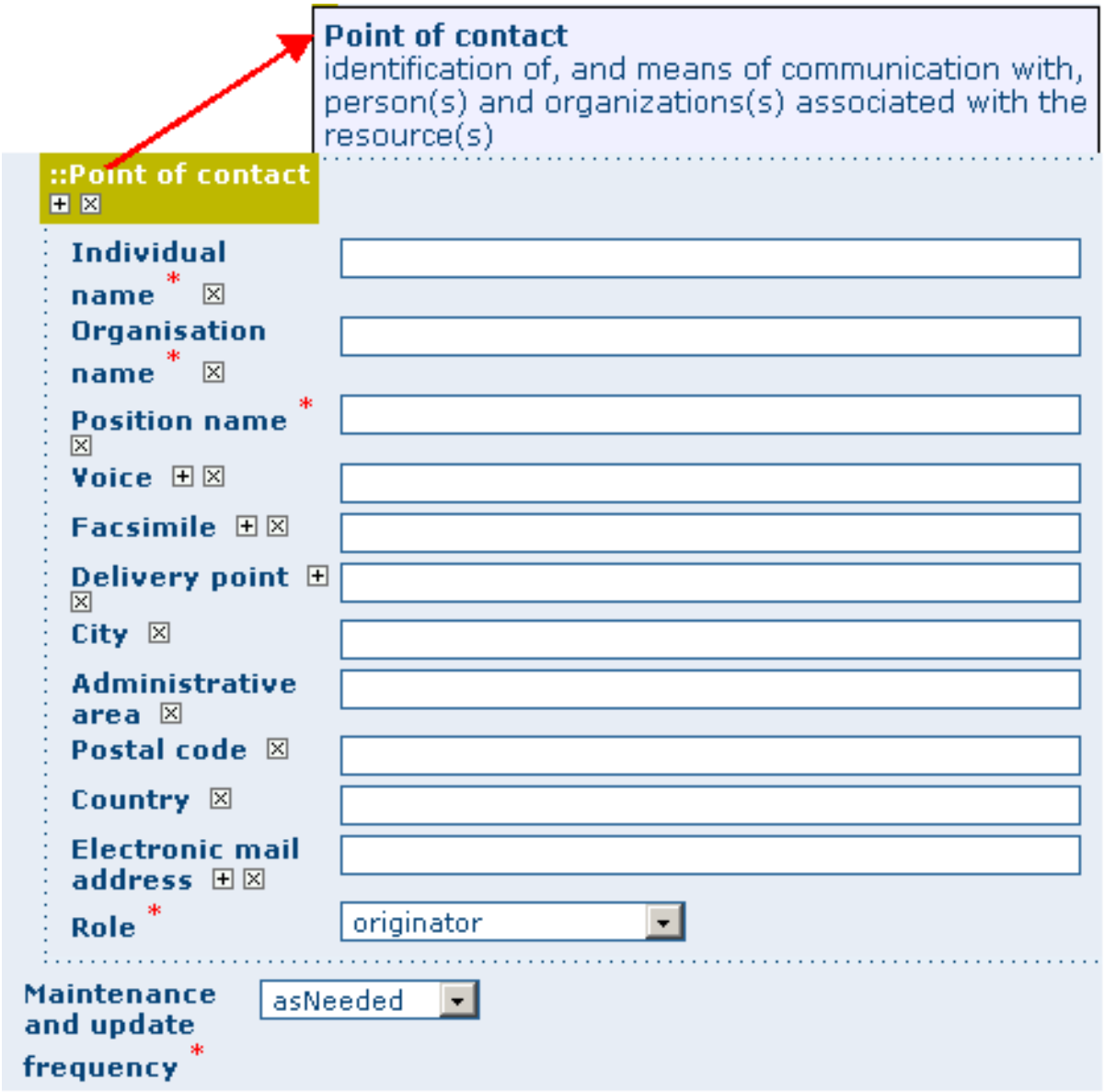



Figure 2.36: *Point of Contact*

need to add multiple fields can arise if the content of your dataset has some text written in two different languages.

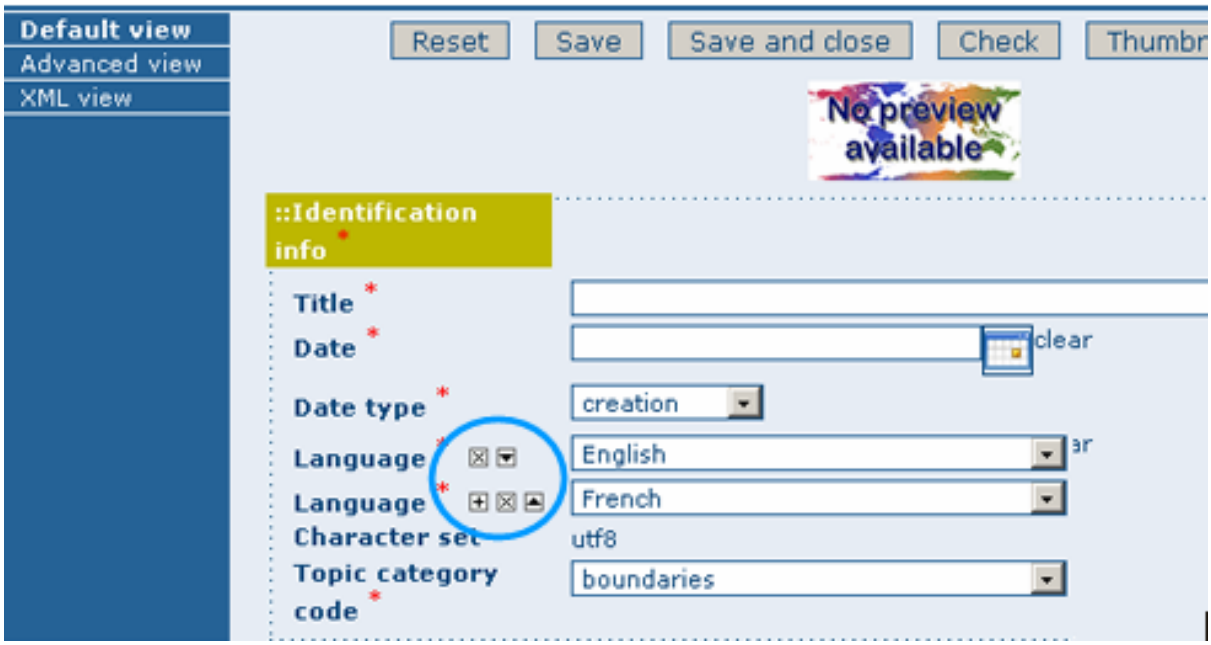



Figure 2.37: *Describing multilingual data*

## 2.5 Entering Metadata for your Map

As we mentioned in the introduction to this guide, GNos provides tools to describe any type of geographic data (verctor layers, raster, tables, map services, etc.) as well as general document like reports, projects, papers, etc. For the purpose of this Quick Start Guide, an example of required and useful metadata elements to properly describe a thematic map will be provided hereafter. You should gather as much information as possible to identify and understand the map's resource and characteristics you want to describe. Use the default view to start. If necessary, you can always switch to advanced view or come back later and edit the record with the additonal information collected.

### 2.5.1 Entering Metadata For Your Map

Please follow these steps to enter your map's metadata. Note that we will only go through the fields that have been identified as compulsory (i.e. those fields marked with the asterix [*], mandatory or highly recommended).

**Title** *: Under the Identification Info field, give your map a name. There will be a default name of your data. Use free text to describe your map here.

**Date** *: Indicate the exact date of creation, publication or revision on your map.

**Presentation Form**: Specify the type of presentation, i.e. digital, hard copy, table, etc.

**Abstract** *: Enter some description of the map.

**Purpose**: Enter a short summary of the purposes for your map to be developed.

**Status**: Specify the status of your map within the following options: completed, historical archive, obsolete, ongoing, planned, required, under development.

**Point of Contact**: Enter all mandatory information and others you have at hand for the contact of the person(s) associated with this resources of the map. Note that some fields are only conditionally mandatory, such as Organization Name if Individual Name and Position are not entered.

**Maintenance and update frequency** * : Specify the frequency with which you expect to make changes and additions to your map after the initial version is completed. If any changes are scheduled you can leave As Needed selected from the drop-down list.

**Descriptive Keywords**: Enter keywords that describe your map. Also specify the type of keyword you are entering, i.e. place, theme, etc. Remember that you can add another keyword field if you need to add different types of keywords.

**Access Constraints**: Enter an access constraint here, such as a copyright, trademark, etc. to assure the protection of privacy and intellectual property.

**User Constraints**: Enter a user constraint here to assure the protection of privacy and intellectual property.

**Other Constraints** * : Enter other constraint here to assure the protection of privacy and intellectual property. Note that this field is conditionally mandatory if Access and Use constraints are not entered.

**Spatial representation type**: Select, from the drop-down list the method used to spatially represent your data. The options are: vector, grid, text table, stereo model, video.

**Scale Denominator** * : Enter the denominator for an equivalent scale of a hard copy of the map.

**Language*** : Select the language used within your map

**Topic category** * : Specify the main ISO category/ies through which your map could be classified (see Annex for the complete list of ISO topic categories).

**Temporal Extent** * : Enter the starting and ending date of the validity period.

**Geographic Bounding Box** * : Enter the longitude and latitude for the map or select a region from the predefined drop-down list. Make sure you use degrees for the unit of the geographic coordinates as they are the basis for the geographic searches.

**Supplemental Information**: Enter any other descriptive information about your map that can help the user to better understand its content.

**Distribution Info**: Enter information about the distributor and about options for obtaining your map.

**Online Resource**: Enter information about online resources for the map, such as where a user may download it, etc. This information should include a link, the link type (protocol) and a description of the resource.

**Reference System Info**: Enter information about the spatial reference system of your map. The default view contains one element to provide the alphanumeric value identifying the reference system used. GNos uses the EPSG codes which are numeric codes associated with coordinate system definitions. For instance, EPSG:4326 is Geographic lat-long WGS84, and EPSG:32611 is "UTM zone 11 North, WGS84". Using elements from the advanced view, you may add more details on data projection, ellipsoid and datum. Note that if this information is provided, a reference system identifier is not mandatory.

**Data Quality**: Specify the hierarchal level of the data (dataset series, dataset, features, attributes, etc.) and provide a general explanation on the production processes (lineage) used for creating the data. The statement element is mandatory if the hierarchical level element is equal to dataset or series. Detailed

information on completeness, logical consistency and positional, thematic and temporal accuracy can be directly added into the advanced form.

**Metadata Author** * : Provide information about the author of the map, including the person's name, organization, position, role and any other contact information available.

After completion of this section, you may select the Type of document that you are going to save in the catalogue. You have three options: Metadata, Template, Sub-template. By default Metadata is set up.

When done, you may click `Save` or `Save and Close` to close the editing session.

### 2.5.2 Metadata validation

In editing mode, editors could validate the current metadata record against standard rules and recommendations.

For all standards, a first level of validation is made for XML metadata validation based on XML Schema (XSD). For ISO19139 records, other rules are checked:

- ISO recommendations
- GeoNetwork recommendations
- (Optional and not available by default) INSPIRE recommendations

The validation report display the list of rules checked and their status (pass or failed). The top checkbox allows to display only errors or all.

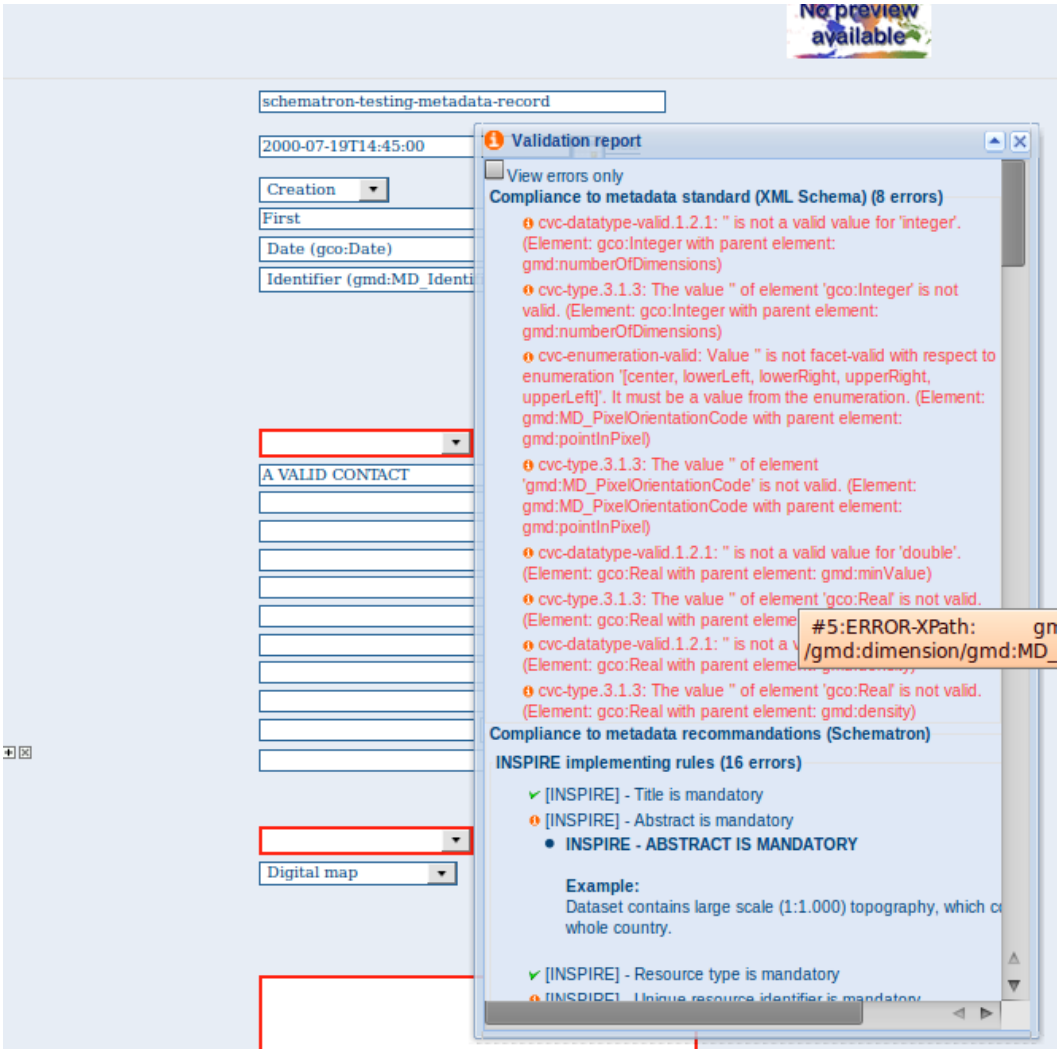
### 2.5.3 Creating a Thumbnail

Next, you need to create a graphic overview of your map which will be for a double purpose; as small thumbnail will be displayed in search results and as large thumbnail with much more details, to allow users to properly evaluate the data usefulness. As for the latest, the image that you will use as source should be a significant reproduction of the real dataset, possibly inclusive of the legend.

To create a thumbnail, go to the editing menu for your map. If you are no longer in editing mode, retrieve the map from one of the search options then click on Edit. Then follow these simple steps:

From the editing menu, click on the Thumbnails button on the top or bottom of the page.

- You will be taken to the Thumbnail Management wizard.
- To create a small or large thumbnail, click on the Browse button next to either one. It is recommended that you use 180 pixels for small thumbnails and 800x600 for large thumbnails. Using the 'Large thumbnail' option allows you to create both a small and large thumbnail in one go.
- You can use GIF, PNG and JPEG images as input for the thumbnails.
- A pop up window will appear allowing you to browse your files on your computer. Select the file you wish to create a thumbnail with by double-clicking on it.
- Click on `Add`.
- Your thumbnail will be added and displayed on the following page.
- You can then click on Back to Editing and save your record.


No preview available
schematron-testing-metadata-record
2000-07-19T14:45:00
Creation
First
Date (gco:Date)
Identifier (gmd:MD_Identi
A VALID CONTACT
Digital map
Validation report
View errors only
Compliance to metadata standard (XML Schema) (8 errors)
cvc-datatype-valid.1.2.1: '' is not a valid value for 'integer'. (Element: gco:Integer with parent element: gmd:numberOfDimensions)
cvc-type.3.1.3: The value '' of element 'gco:Integer' is not valid. (Element: gco:Integer with parent element: gmd:numberOfDimensions)
cvc-enumeration-valid: Value '' is not facet-valid with respect to enumeration '[center, lowerLeft, lowerRight, upperRight, upperLeft]'. It must be a value from the enumeration. (Element: gmd:MD_PixelOrientationCode with parent element: gmd:pointInPixel)
cvc-type.3.1.3: The value '' of element 'gmd:MD_PixelOrientationCode' is not valid. (Element: gmd:MD_PixelOrientationCode with parent element: gmd:pointInPixel)
cvc-datatype-valid.1.2.1: '' is not a valid value for 'double'. (Element: gco:Real with parent element: gmd:minValue)
cvc-type.3.1.3: The value '' of element 'gco:Real' is not valid.
#5:ERROR-XPath:
/gmd:dimension/gmd:MD_
cvc-type.3.1.3: The value '' of element 'gco:Real' is not valid. (Element: gco:Real with parent element: gmd:density)
Compliance to metadata recommandations (Schematron)
INSPIRE implementing rules (16 errors)
[INSPIRE] - Title is mandatory
[INSPIRE] - Abstract is mandatory
INSPIRE - ABSTRACT IS MANDATORY
Example:
Dataset contains large scale (1:1.000) topography, which c
whole country.
[INSPIRE] - Resource type is mandatory

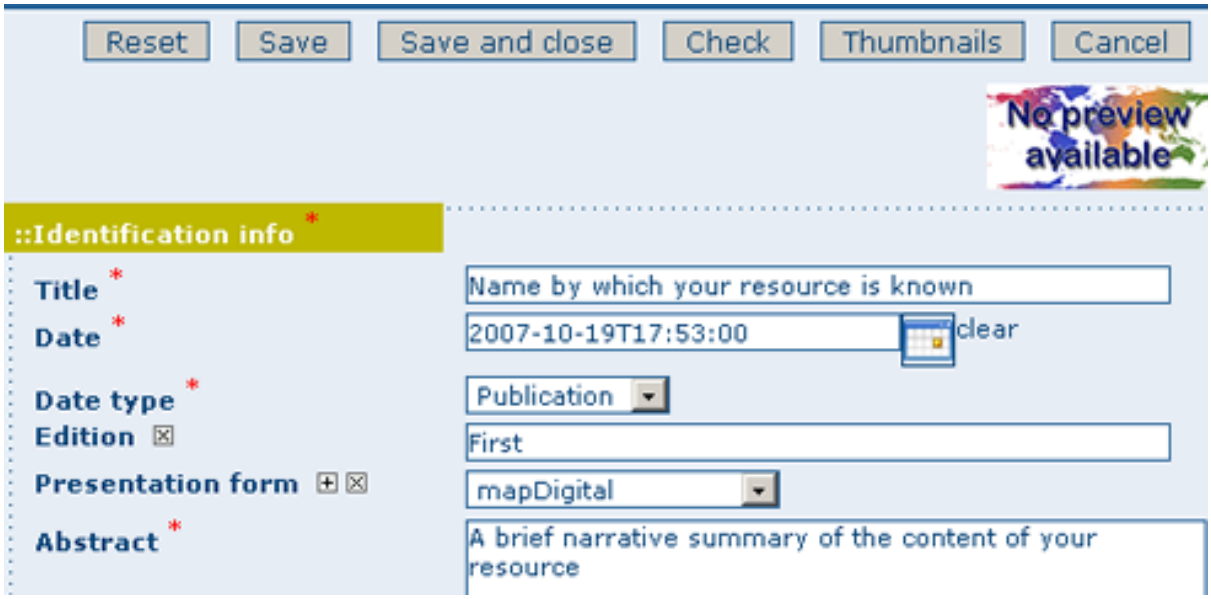



Figure 2.38: *The thumbnail wizard button*

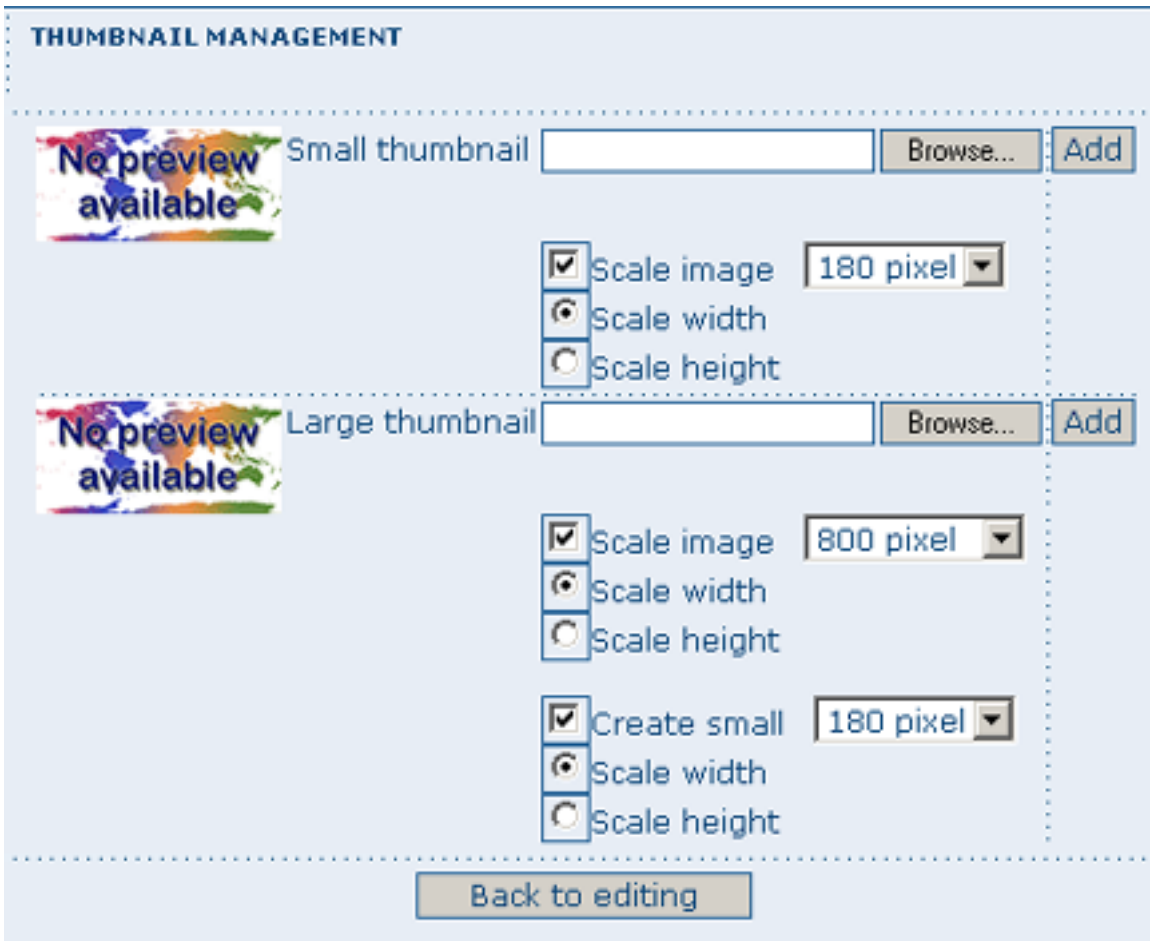



Figure 2.39: *Thumbnail wizard*

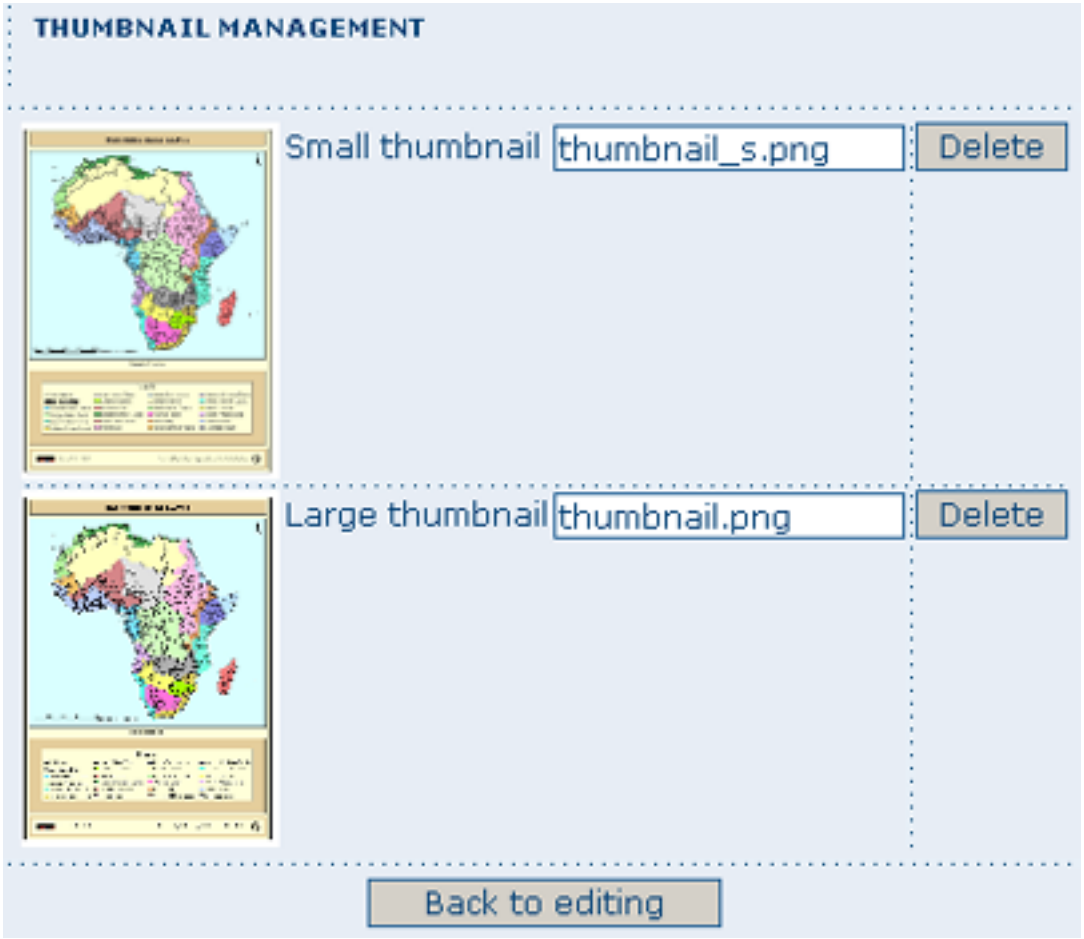



Figure 2.40: *Completed thumbnail wizard*

### 2.5.4 Linking WMS online resources

Metadata records in ISO19139 could be related to resources defined in WMS services. When searching metadata that has related WMS online resources, the *Interactive Map* button is displayed to load the WMS layer/s in the map viewer. A WMS online resource can be referenced in metadata like:

- Selecting protocol **OCG-WMS Web Map Capabilities 1.1.1** or **OCG-WMS Web Map Capabilities 1.3.0**:

1. *URL*: Url of WMS service
2. Name of the resource: empty.

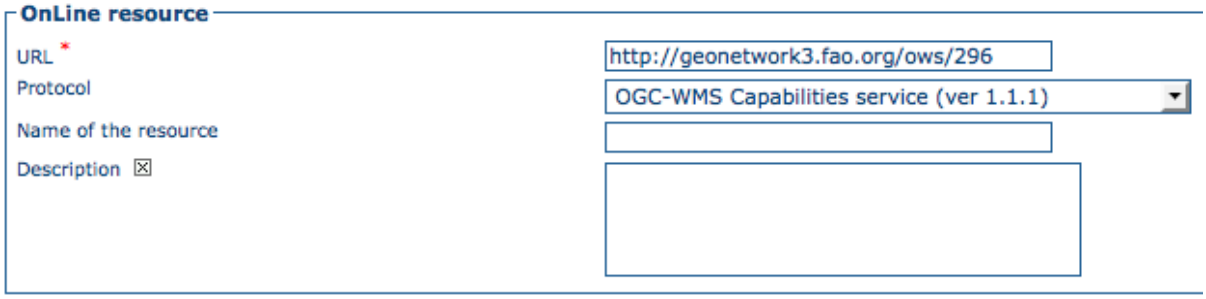



Figure 2.41: *WMS online resource*

The *Interactive Map* button opens a window to select the layer/s defined in WMS capabilities document to load in map viewer.

- Selecting protocols **OGC-WMS Web Map Service**, **OGC Web Map Service 1.1.1** or **OGC Web Map Service 1.3.0**:

1. *URL*: Url of WMS service
2. *Name of the resource*: WMS layer name (optional)

The behaviour the *Interactive Map* button depends if user indicated the layer name in the field *Name of the resource* or not, to show the window to select the layer/s to load in map viewer or load the layer directly.

### 2.5.5 Linking data for download

Finally, you can upload the dataset stored on your local computer and then create a link between data and related description. Files in whatever format can be uploaded: doc, PDF, images, vector layers, etc. For the latter the distribution in a compressed file is recommended. You can include the verctor data, the legend, any documentation that can help the interpretation of the data, related reports, detailed descriptions of the data processing, base data used to create the dataset specified and/or other relevant information. Follow these guidelines for uploading datasets:

- Make sure the total size of the compressed file is reasonable (less than 50 MB). Should your data be bigger than 50MB, consider a different mechanism to serve this data, e.g. through an FTP or HTTP server and than link the resource through an online resource 'Web address (URL)'.
- You can create several smaller files when appropriate and upload them sequentially.
- You add the size of the file at the end of the description field.

To Upload a Dataset, follow these steps:

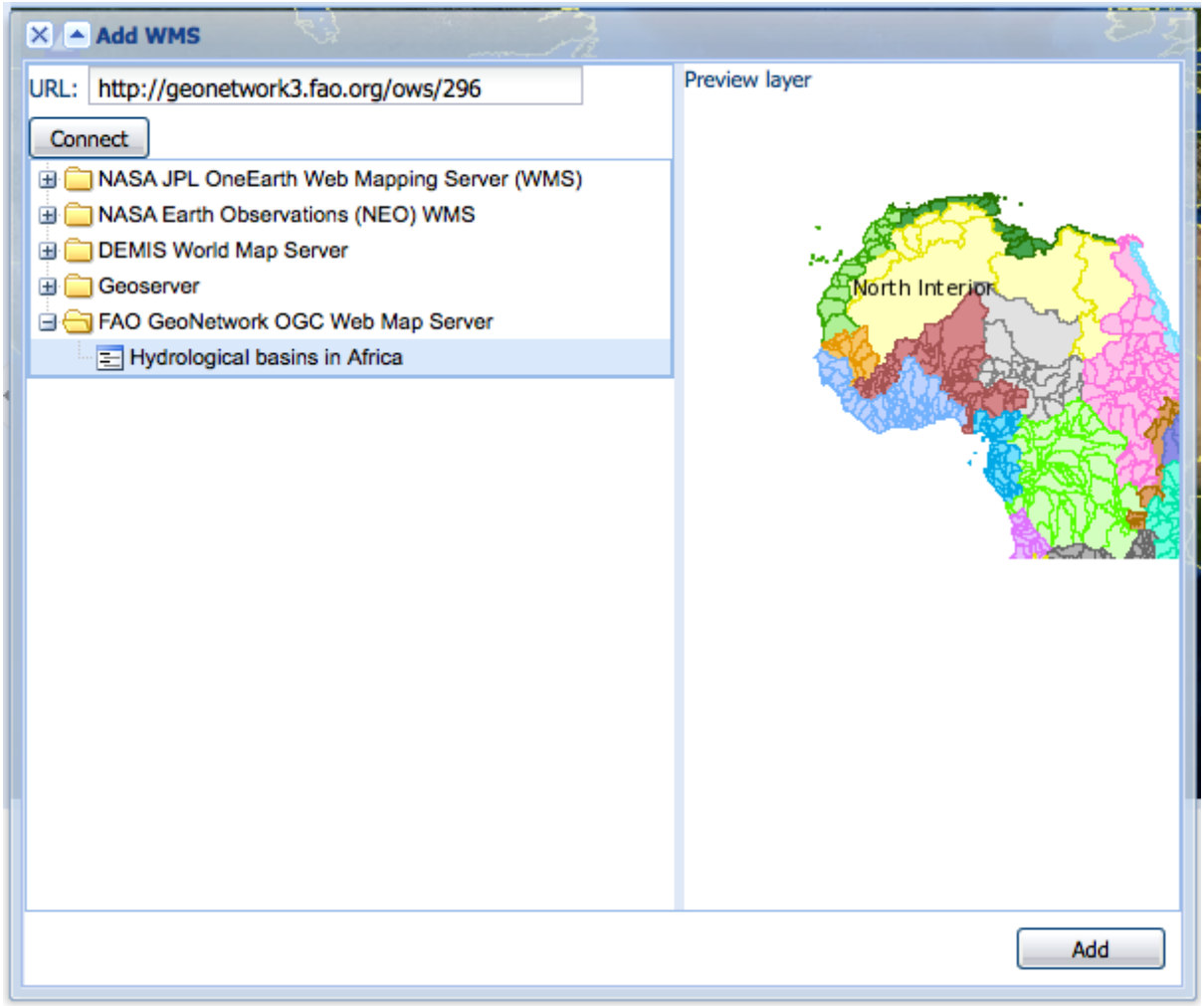



Figure 2.42: *Window to select WMS layer/s referenced in online resource to load in map viewer*

Figure 2.43: *WMS online resource*

1. The URL field can be left empty when uploading a file. The system will automatically fill this field out;
2. Select the correct protocol to be used. If you do not see the buttons to browse and upload when File for download is selected, save the metadata and return to the upload section. Both buttons should appear;
3. Provide a short description of the data;
4. Click the Browse button and navigate to the folder where the file to be released is stored. Consider if you want to upload multiple files as one unique zip file or as multiple separate downloads. It is a good idea to add additional documentation with the datasets that provide the user with information related to the data described. Remind: the size of a single file to upload can't exceed 50 Mbytes;
5. Click Upload and then Save.

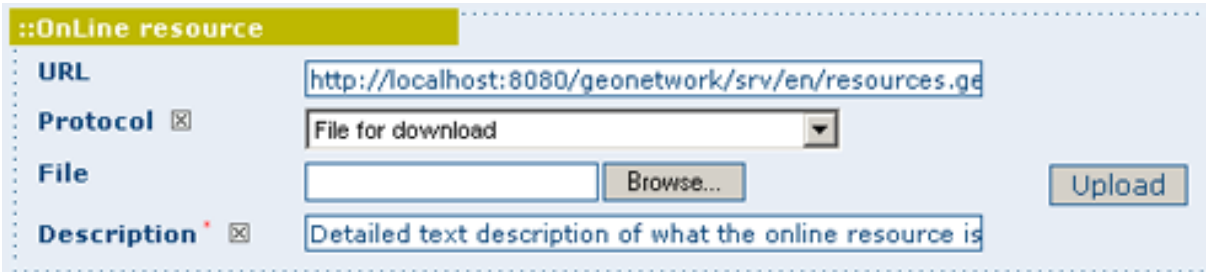



Figure 2.44: *An online resource*

### 2.5.6 Linking metadata

Metadata records in ISO19139 could be related together based on ISO elements using for example:

- parent identifier
- operates on element for service metadata

Using GeoNetwork editor, user could define 3 types of relation:

- dataset metadata / service metadata (including a link to the data based on WMS layer name)
- parent / child relation
- feature catalogue (ISO19110) / dataset metadata (ISO19139)

All relations are described in the top right corner of the metadata. The menu allows navigation from one record to the other. Only metadata records visible to current user are displayed (ie. a metadata could be linked to another one but not displayed because not published for current user).

#### Parent / child relation

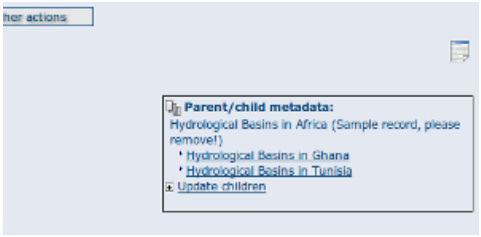
To create a child record, editors could click on the other actions menu, create child option in the search results.

Using this option, parent identifier will be automatically set up when duplicating the record.

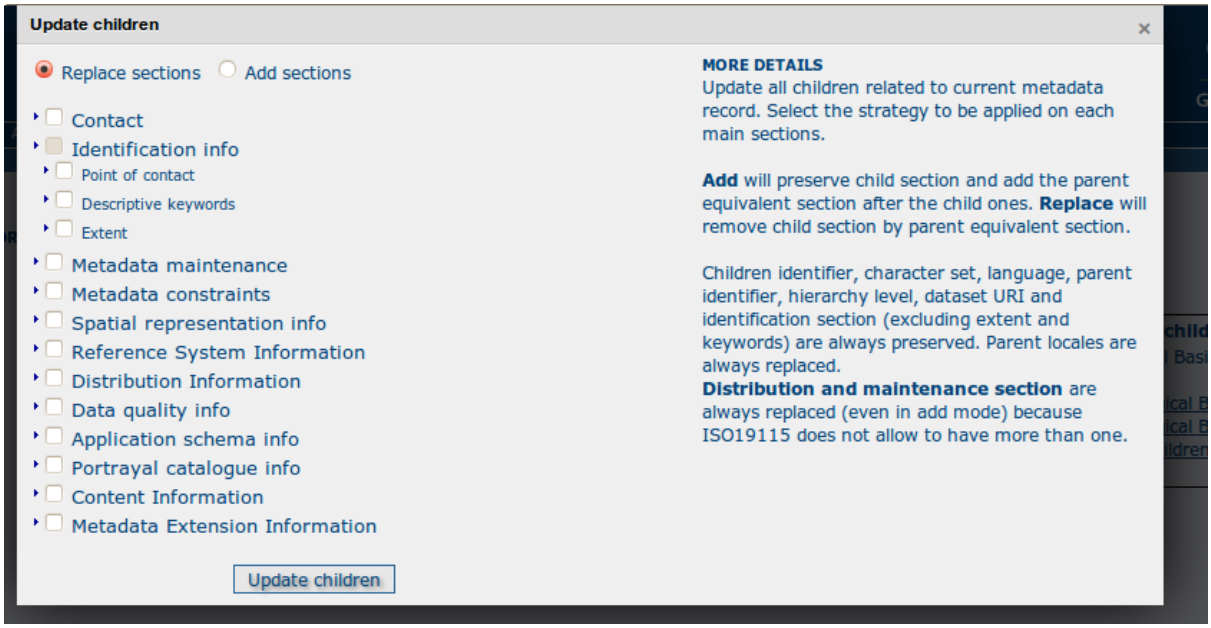
Editors could also link an existing metadata record using the parent identifier displayed in the advanced view, metadata section. Clicking on the Add or update parent metadata section on the metadata relation

list will move to this view. Then editors should use the (+) to expand the parent identifier and click on the field to open the metadata selection panel.

Once the parent selected, it will appear in the metadata relation list on the top right corner of the editor.



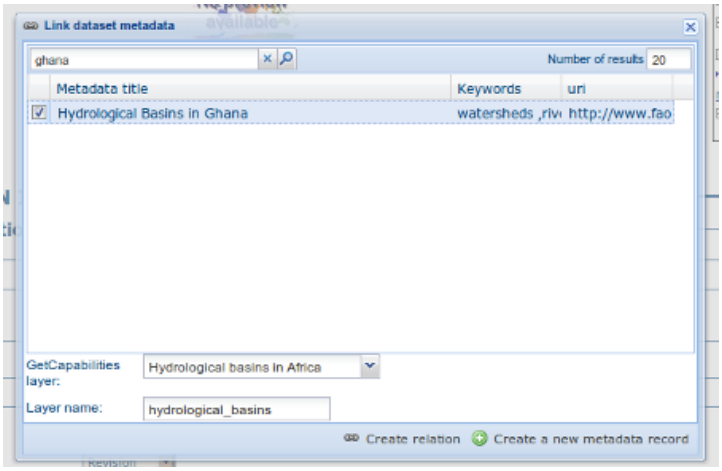

If a metadata record has children attached, the editor suggest the children update mechanism which propagate changes from a parent to all its children. The following interface define the configuration of the propagation:


Update children
Replace sections
Add sections
Contact
Identification info
Point of contact
Descriptive keywords
Extent
Metadata maintenance
Metadata constraints
Spatial representation info
Reference System Information
Distribution Information
Data quality info
Application schema info
Portrayal catalogue info
Content Information
Metadata Extension Information
Update children
MORE DETAILS
Update all children related to current metadata record. Select the strategy to be applied on each main sections.
Add will preserve child section and add the parent equivalent section after the child ones. Replace will remove child section by parent equivalent section.
Children identifier, character set, language, parent identifier, hierarchy level, dataset URI and identification section (excluding extent and keywords) are always preserved. Parent locales are always replaced.
Distribution and maintenance section are always replaced (even in add mode) because ISO19115 does not allow to have more than one.

### Metadata on dataset / metadata on service relation

Linking a dataset to a service or a service to a dataset is made using the following panel:

Editor could define a layer name using the combo box (which try to retrieve layers from the WMS GetCapabilities document) or typing the layer name in the text field. This information is required to display the layer using the map viewer.




Relation is stored in :

```
<srv:operatesOn uuidref="" xlink:href=""/>
```

and (according to ISO CSW profil)

```
<srv:coupledResource>
  <srv:SV_CoupledResource>
    <srv:operationName></srv:operationName>
    <srv:identifier></srv:identifier>
    <gco:ScopedName></gco:ScopedName>
  </srv:SV_CoupledResource>
</srv:coupledResource>
```

Only relation between records in the same catalogue are handle. Use of XLink attributes are not supported to create relation between datasets and services.

#### Feature catalogue relation

Feature catalogues are records stored in ISO 19110 standard. Relation between the 2 records are created using the link feature catalogue menu.

### 2.5.7 Compute bounding box from keywords

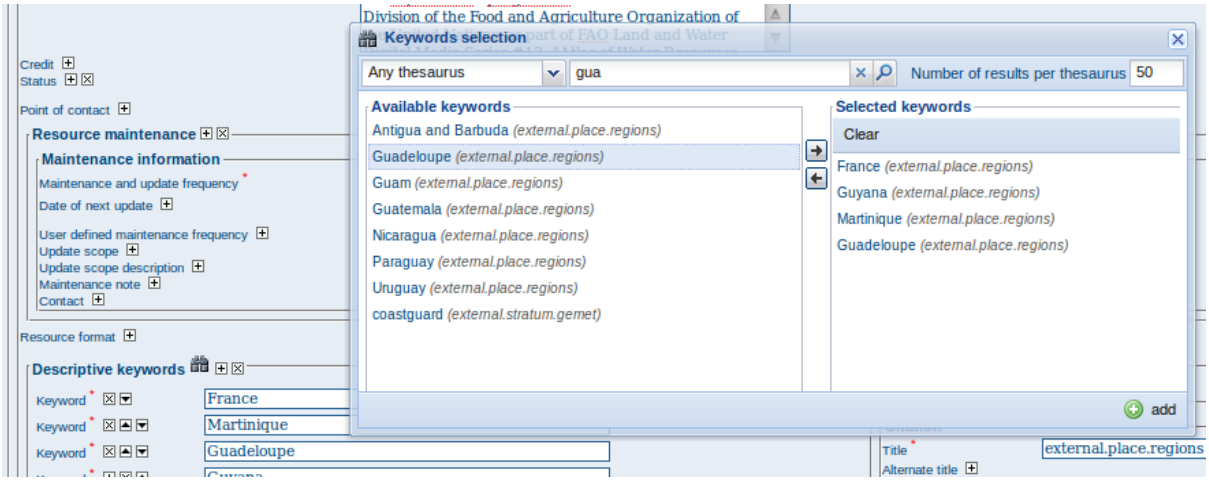
Editor can add extent information based on keyword analysis.

- For each keywords
- Search for the keyword in thesaurus
- If keyword in the thesaurus has an extent
- Add an extent with a description and a bounding box to the metadata record.

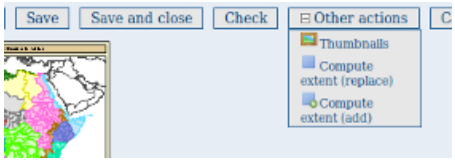
The process could be run in 2 modes :

- Add : Keep existing extent elements and add the new one at the end. Editor could clean the section after processing.
- Replace : Remove all extent having only a bounding box (temporal, vertical and bounding polygon are not removed), and add the new one at the end.

Editor need to select keyword from a thesaurus with spatial information. The name is added to the extent description field.




Then in the other actions menu, the compute boundinx box menus are available:




The metadata is saved during the process and one extent is added for each keywords.

If user manually add keywords just before computing bounding box, then it's recommended to save your metadata record before launching the action in order to have latest keywords taken into account.

### 2.5.8 Assigning Privileges for a Map

As an important step of entering metadata to your map, you need to assign privileges for each map. This means that you will identify which work groups have which privileges, i.e. view, download, etc. for your particular map.

For instance, you can fdefine if the information and related services is visible to all (Internet users) or just to internal users only (Intranet). Privileges are assigned on a per group basis. Depending on the user profile (Guest, Registered User, Editor, Admin etc.) access to these functions may differ on a per user basis.

To assign privileges for your map, follow these steps:

- Find your map by using the search option. Whether you have multiple or single results from the search, on top of the individual record or next to the record you will always see a row of buttons including a Privileges button.
- Click on the Privileges button. This will take you to a new page. You can assign certain privileges to specific groups by selecting or deselecting them from this page. Simply click on the small box next to the privilege to place or remove a checkmark. Set All and Clear All buttons allow you to place and remove the checkmarks all at once.

Below is a brief description for each privilege to help you identify which ones you should assign to which group(s).

Figure 2.45: *The editing toolbar with Privileges button*

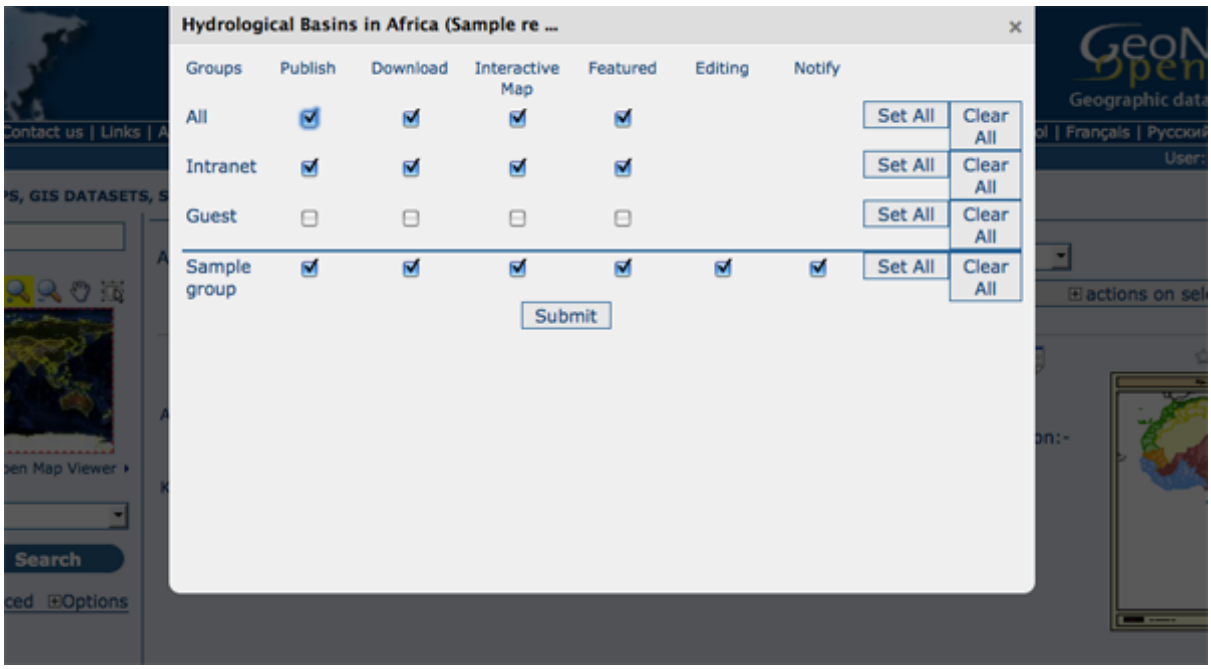



Figure 2.46: *Privileges settings*

**Publish**: Users in the specified group/s are able to see the map, i.e. if searching with matching criteria.

**Download**: Users in the specified group/s are able to download the map.

**Interactive Map**: Users in the specified group/s are able to get an interactive map. The interactive map has to be created separately using a Web Map Server, which is part of the GeoNetwork opensource application.

**Featured**: When selected, the map is placed in the Features Maps of the home page and it appears there randomly.

**Notify**: Users in that work group receive notification that the map has been uploaded.

### 2.5.9 Assigning Categories for a Map

As a final step to entering metadata for a map, you should assign categories for it. The assigned categories will determine the categories the map will display under on the home page. To assign categories for a map, follow these steps:

- Find your map by using the search option. Whether you have multiple or single results from your search, on top of the individual record or next to the record, you will always see a row of buttons including a **Categories** button.
- Click on the **Categories** button. This will take you to a new page. You can assign one or multiple categories selecting or deselecting them from this page. Simply click on the small box next to the category to place or remove a checkmark.

### 2.5.10 Multilingual metadata in ISO19139

Editors could create multilingual metadata using ISO 19139. A default template is provided but user could add translation to an existing record.

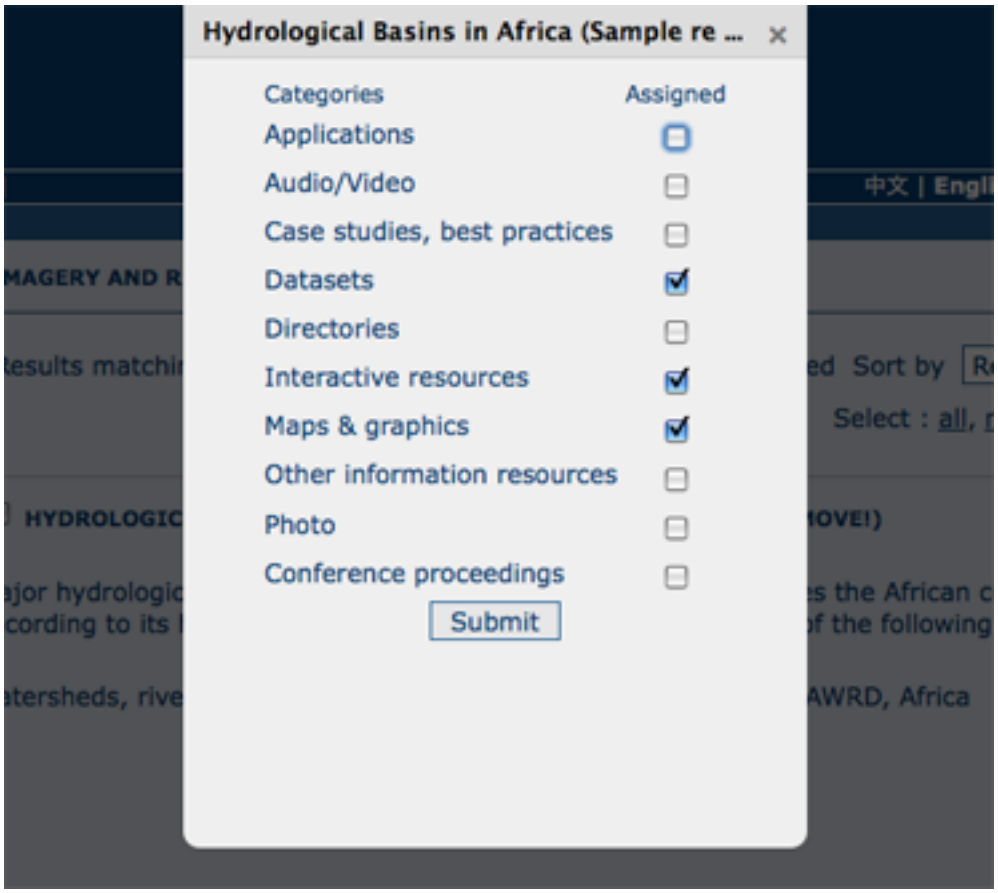



Figure 2.47: *Category management*

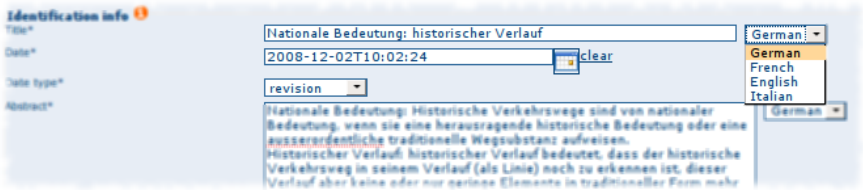
To declare a new language in a metadata record:

- First check, the main language is defined in the metadata section
- then add one or more languages in the other language in the metadata section.

In editing mode, each multilingual elements are composed of:

- text input
- language selection list (language declared on the other language section are listed here)

By default, the selected language is the GUI language if language is defined in the metadata.


Identification info
Nationale Bedeutung: historischer Verlauf
German
2008-12-02T10:02:24
clear
German
French
English
Italian
revision
Nationale Bedeutung: Historische Verkehrswege sind von nationaler Bedeutung, wenn sie eine herausragende historische Bedeutung oder eine ausserordentliche traditionelle Wegsubstanz aufweisen.
Historischer Verlauf: historischer Verlauf bedeutet, dass der historische Verkehrsweg in seinem Verlauf (als Linie) noch zu erkennen ist, dieser

Optionnaly, Google translation service could be used. Translation could be suggested to the editor using the small icon right to the language selector. The translation convert the default metadata character string in the current selected language.

In view mode, according to GUI language : if GUI language is available in the metadata, the element is displayed in this language else the element is displayed in metadata default language. This behaviour is also applied to dublin core output for CSW services.

## 2.6 Uploading a New Record using the XML Metadata Insert Tool

A more advanced procedure to upload a new metadata record in the GeoNetwork system is using an XML document. This procedure is particularly useful for users who already have metadata in XML format, for instance created by some GIS application. To this regard, it has to be noted that the metadata must be in one of the standards used by GeoNetwork: ISO19115, FGDC and Dublin Core.

To start the metadata uploading process through the **XML Metadata Insert** tool, you should log in and select the appropriate option from the Administration page.

The main part of the page **Import XML Formatted Metadata** that is displayed is the **Metadata** text area, where the user can paste the XML metadata to import. Below this, there is the **Type** choice, which allows you select the type of record that you are going to create (Metadata, Template and Subtemplate). Then you can apply a stylesheet to convert your metadata input from ArcCatalog8 to ISO1915 or from ISO19115 to ISO19139, if required. Otherwise you can just leave none selected. The **Destination schema** list provides you with four options to choose the final standard layout for your metadata (ISO19115, ISO19139, FGDC and Dublin Core). Finally you should select the **Group** as main group in charge of the metadata and the **Category** that you want to assign to your metadata. By clicking the **Insert** button the metadata is imported into the system; please note that all links to external files, for instance to thumbnails or data for download, have to be removed from the metadata input, to avoid any conflict within the data repository.

If your metadata is already in ISO19115 format, the main actions to be performed are the following:

1. Paste the XML file that contains the metadata information in the **Metadata** text area;
2. Select Metadata as **type** of record that you are going to create

Figure 2.48: *Administration panel*

3. Select the metadata schema ISO19139 that will be the final **destination schema**;
4. Select the **validate** check box if you want your metadata to be validated according to the related schema.
5. Select the **group** in charge of the metadata from the drop down list;
6. Select **Maps and Graphics** from the list of categories;
7. Click the **Insert** button and the metadata will be imported into the system.

## 2.7 Metadata in Spatial Data Management

### 2.7.1 What is Metadata?

Metadata, commonly defined as "data about data" or "information about data", is a structured set of information which describes data (including both digital and non-digital datasets) stored in administrative systems. Metadata may provide a short summary about the content, purpose, quality, location of the data as well as information related to its creation.

### 2.7.2 What are Metadata Standards?

Metadata standards provide data producers with the format and content for properly describing their data, allowing users to evaluate the usefulness of the data in addressing their specific needs.

The standards provide a documented, common set of terms and definitions that are presented in a structured format.

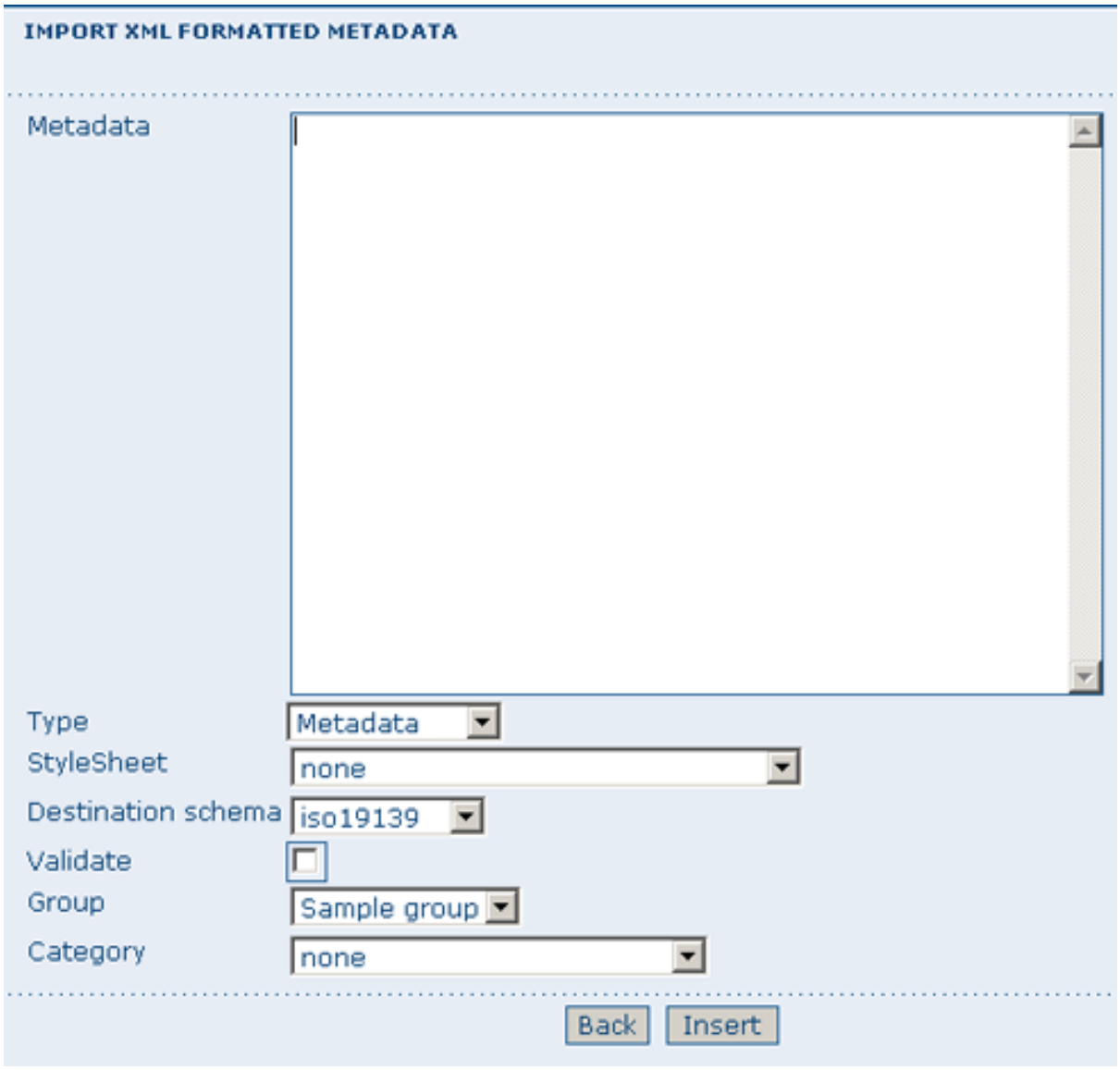



Figure 2.49: *XML metadata import tool*

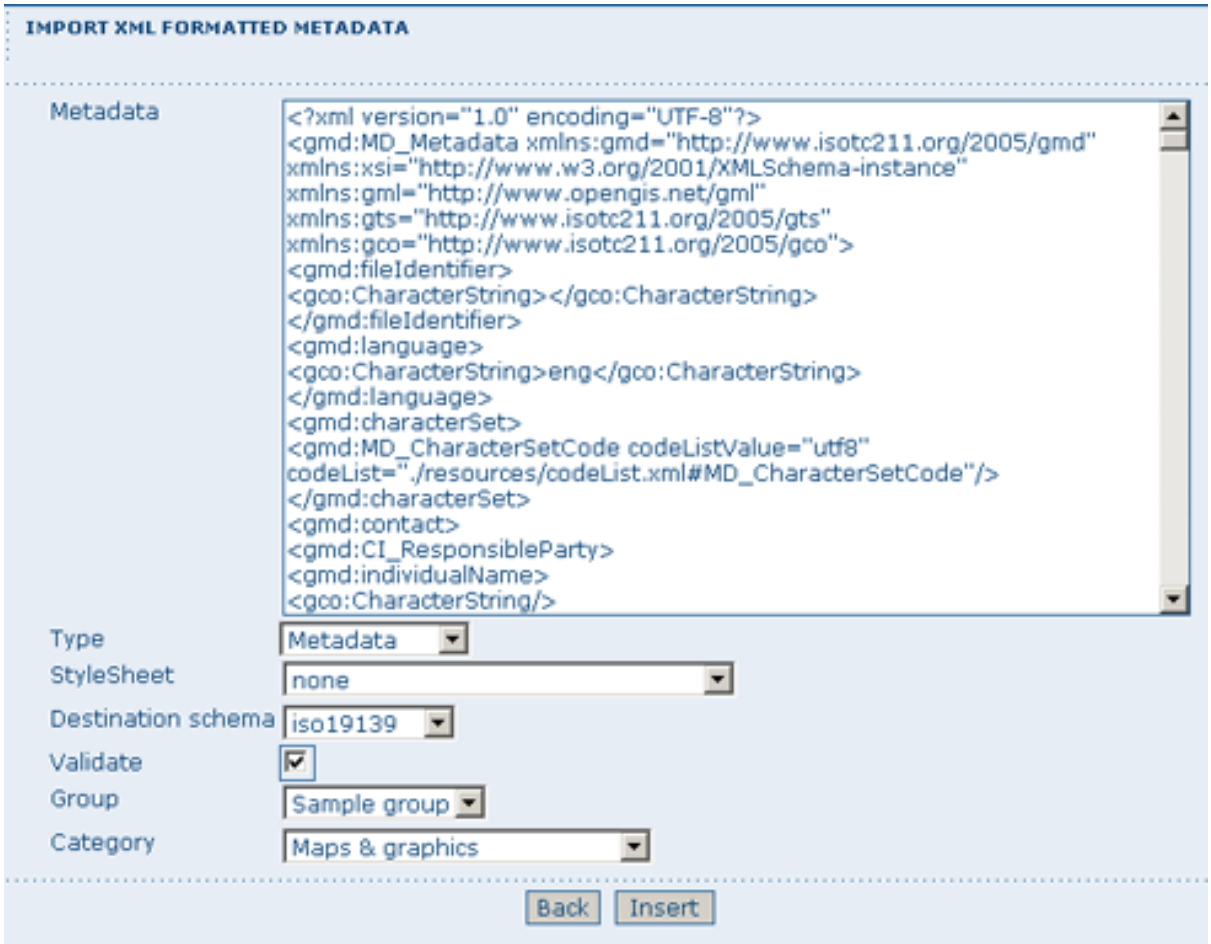



Figure 2.50: *XML metadata import 2*

### 2.7.3 Why do we need Standardised Metadata?

Standardised metadata support users in effectively and efficiently accessing data by using a common set of terminology and metadata elements that allow for a quick means of data discovery and retrieval from metadata clearinghouses. The metadata based on standards ensure information consistency and quality and avoid that important parts of data knowledge are lost.

### 2.7.4 Geographic Information Metadata Standard

Geographic data, which can be defined as any data with a geographic component, is often produced by one individual or organisation, and may address the needs of various users, including information system analysts, programme planners, developers of geographic information or policy makers. Proper standard documentation on geographic data enable different users to better evaluate the appropriateness of data to be used for data production, storage, update.

The metadata standards supported by GeoNetwork opensource are the **ISO 19115:2003** - approved by the international community in April 2003 as a tool to define metadata in the field of geographic information - and the **FGDC** - the metadata standard adopted in the United States by the Federal Geographic Data Committee. In addition, GeoNetwork opensource supports also the international standard **Dublin Core** for the description of general documents.

This ISO Standard precisely defines how geographic information and related services should be described, providing mandatory and conditional metadata sections, metadata entities and metadata elements. This standard applies to data series, independent datasets, individual geographic features and feature properties. Despite ISO 19115:2003 was designed for digital data, its principles can be extended to many other forms of geographic data such as maps, charts, and textual documents as well as non-geographic data.

The underlying format of an ISO19115:2003 compliant metadata is XML. GeoNetwork uses the *ISO Technical Specification 19139 Geographic information - Metadata - XML schema implementation* for the encoding of this XML.

### 2.7.5 Metadata profiles

GeoNetwork supports multiple metadata profiles. Profiles can take the form of *Templates* that you can create using the metadata editor. Using the Advanced view of the editor, virtually all of the metadata elements are accessible to the user.

Support for extensions to a metadata standard can also be achieved relatively quick by an experienced XML/XSL software engineer.

### 2.7.6 Transition between metadata standards

With the ISO19115:2003 Metadata standard for Geographic Information now being the preferred common standard, many have a need to migrate legacy metadata into the new standard.

GeoNetwork provides import (and export) functionality and has a number of transformers in place. It is an easy process for a system administrator to install custom transformers based on XSLT.

## 2.8 Installing the software

### 2.8.1 New version - New funtionality

The new GeoNetwork opensource comes with substantial upgrades of different components for a more intuitive and responsive user-system interaction. Web2 technologies have been adopted, in particular AJAX techniques, to allow for more interactive and faster services in the web interface and for the integration of the existing web map viewer in the home page. Similar functionalities have been implemented in the administrative part of the system, to provide an easier access to the configuration pages related to site settings, catalogue harvesting, scheduling and maintenance.

The search interface has been completely overhauled to provide highly interactive searching capabilities. Furthermore, the new version of GNos embeds GeoServer as map server. Users can now not only overlay OGC web map services available on the web, but also create their own map services for other users to browse without having to download additional plugins. Maps created with web map services can be now saved as PDF and sent to others.

The metadata catalogue handles the latest ISO19115:2003 geographic metadata format based on the ISO19139:2007 schemas, as well as the older ISO19115 final draft format, FGDC and Dublin Core. The metadata editor is able to handle the majority of these complex standards, providing default, advanced and XML editing online tools.

The new version has a number of different harvesting interfaces allowing users to connect their own server to many other catalogues around the world. This is the result of the implementation of the open source reference for the web catalog services according to OGC specifications. Harvesting in the new version is fully compatible with GeoNetwork 2.0 and higher nodes.

We have added avanced online and offline administration funcionalities to configure, backup and migrate the application. We have also added a convenient import and export format "MEF" or Metadata Exchange Format, that allows the users to move metadata, previews and even data in a convenient single file. GNos can be easily expanded with plugins to export/import metadata to/from other software supporting MEF.

### 2.8.2 Where do I get the installer?

You can find the software on the Internet at the GeoNetwork opensource Community website. The software is also distributed through the SourceForge.net Website at http://sourceforge.net/projects/geonetwork.

Use the platform independent installer (.jar) if you need anything more than a plain Windows installation.

### 2.8.3 System requirements

GeoNetwork can run either on **MS Windows** , **Linux** or **Mac OS X** .

Some general system requirements for the software to run without problems are listed below:

**Processor** : 1 GHz or higher

**Memory (RAM)** : 512 MB or higher

**Disk Space** : 30 MB minimum. However, it is suggested to have a minimum of 250 MB of free disk space. Additional space is required depending on the amount of spatial data that you expect to upload into the internal geodatabse.

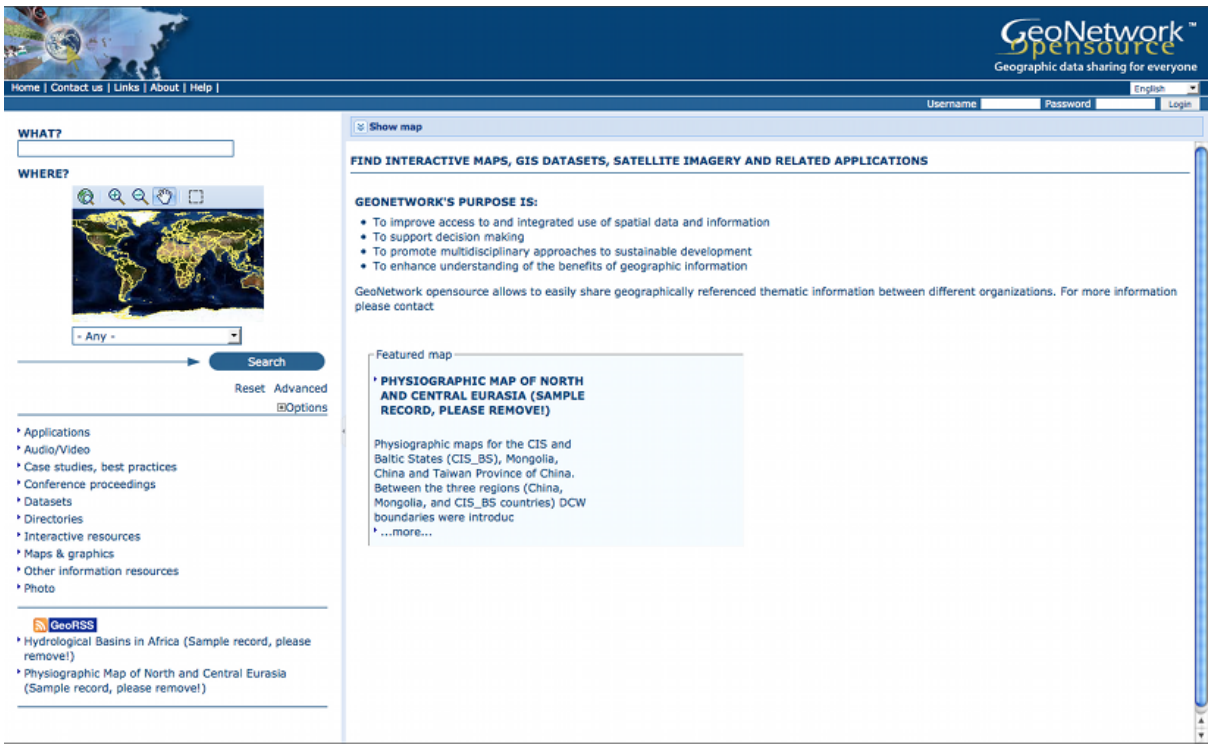

GeoNetwork opensource
Geographic data sharing for everyone
Home | Contact us | Links | About | Help |
English
Username
Password
Login
WHAT?
WHERE?
Show map
FIND INTERACTIVE MAPS, GIS DATASETS, SATELLITE IMAGERY AND RELATED APPLICATIONS
GEONETWORK'S PURPOSE IS:
To improve access to and integrated use of spatial data and information
To support decision making
To promote multidisciplinary approaches to sustainable development
To enhance understanding of the benefits of geographic information
GeoNetwork opensource allows to easily share geographically referenced thematic information between different organizations. For more information please contact
- Any -
Search
Reset
Advanced
Options
Featured map
PHYSIOGRAPHIC MAP OF NORTH AND CENTRAL EURASIA (SAMPLE RECORD, PLEASE REMOVE!)
Physiographic maps for the CIS and Baltic States (CIS_BS), Mongolia, China and Taiwan Province of China. Between the three regions (China, Mongolia, and CIS_BS countries) DCW boundaries were introduc
...more...
Applications
Audio/Video
Case studies, best practices
Conference proceedings
Datasets
Directories
Interactive resources
Maps & graphics
Other information resources
Photo
GeoRSS
Hydrological Basins in Africa (Sample record, please remove!)
Physiographic Map of North and Central Eurasia (Sample record, please remove!)

Figure 2.51: *Standard home page of GeoNetwork opensource*

**Other Software requirements** : A Java Runtime Environment (JRE 1.5.0). For server installations, Apache Tomcat and a dedicated JDBC compliant DBMS (MySQL, Postgresql, Oracle) can be used instead of Jetty and McKoiDB respectively.

### Additional Software

The software listed here is not required to run GeoNetwork, but can be used for custom installations.

1. MySQL DBMS v5.5+ (All) [1]
2. Postgresql DBMS v7+ (All) [1]
3. Apache Tomcat v5.5+ (All) [1]
4. Druid v3.8 (All) [1] to inspect the database

### Supported browsers

GeoNetwork should work normally with the following browsers:

1. Firefox v1.5+ (All) [1]
2. Internet Explorer v6+ (Windows)
3. Safari v3+ (Mac OS X Leopard)

[1] All = Windows, Linux and Mac OS X

### 2.8.4 How do I install GeoNetwork opensource?

Before running the GeoNetwork installer, make sure that all system requirements are satisfied, and in particular that the Java Runtime Environment version 1.5.0 is set up on your machine.

#### On Windows

If you use Windows, the following steps will guide you to complete the installation (other FOSS will follow):

1. Double click on **geonetwork-install-2.2.0.exe** to start the GeoNetwork opensource desktop installer
2. Follow the instructions on screen. You can choose to install sample data, install the embedded map server (based on GeoServer and the CSW 2.0.1 test client. Developers may be interested in installing the source code and installer building tools. Full source code can be found in the GeoNetwork SubVersion code repository.
3. After completion of the installation process, a 'GeoNetwork desktop' menu will be added to your Windows Start menu under 'Programs'
4. Click Start>Programs>GeoNetwork desktop>Start server to start the Geonetwork opensource Web server. The first time you do this, the system will require about 1 minute to complete startup.
5. Click Start>Programs>Geonetwork desktop>Open GeoNetwork opensource to start using GeoNetwork opensource, or connect your Web browser to http://localhost:8080/geonetwork/

#### Installation using the platform independent installer

If you downloaded the platform independent installer (a .jar file), you can in most cases start the installer by simply double clicking on it.

Follow the instructions on screen (see also the section called On Windows).

At the end of the installation process you can choose to save the installation script (Figure Save the installation script for commandline installations).

#### Commandline installation

If you downloaded the platform independent installer (a .jar file), you can perform commandline installations on computers without a graphical interface. You first need to generate an install script (see Figure Save the installation script for commandline installations). This install script can be edited in a text editor to change some installation parameters.

To run the installation from the commandline, issue the following command in a terminal window and hit enter to start:

```
java -jar geonetwork-install-2.2.0-0.jar install.xml
[ Starting automated installation ]
[ Starting to unpack ]
[ Processing package: Core (1/3) ]
[ Processing package: Sample metadata (2/3) ]
[ Processing package: GeoServer web map server (3/3) ]
[ Unpacking finished ]
```

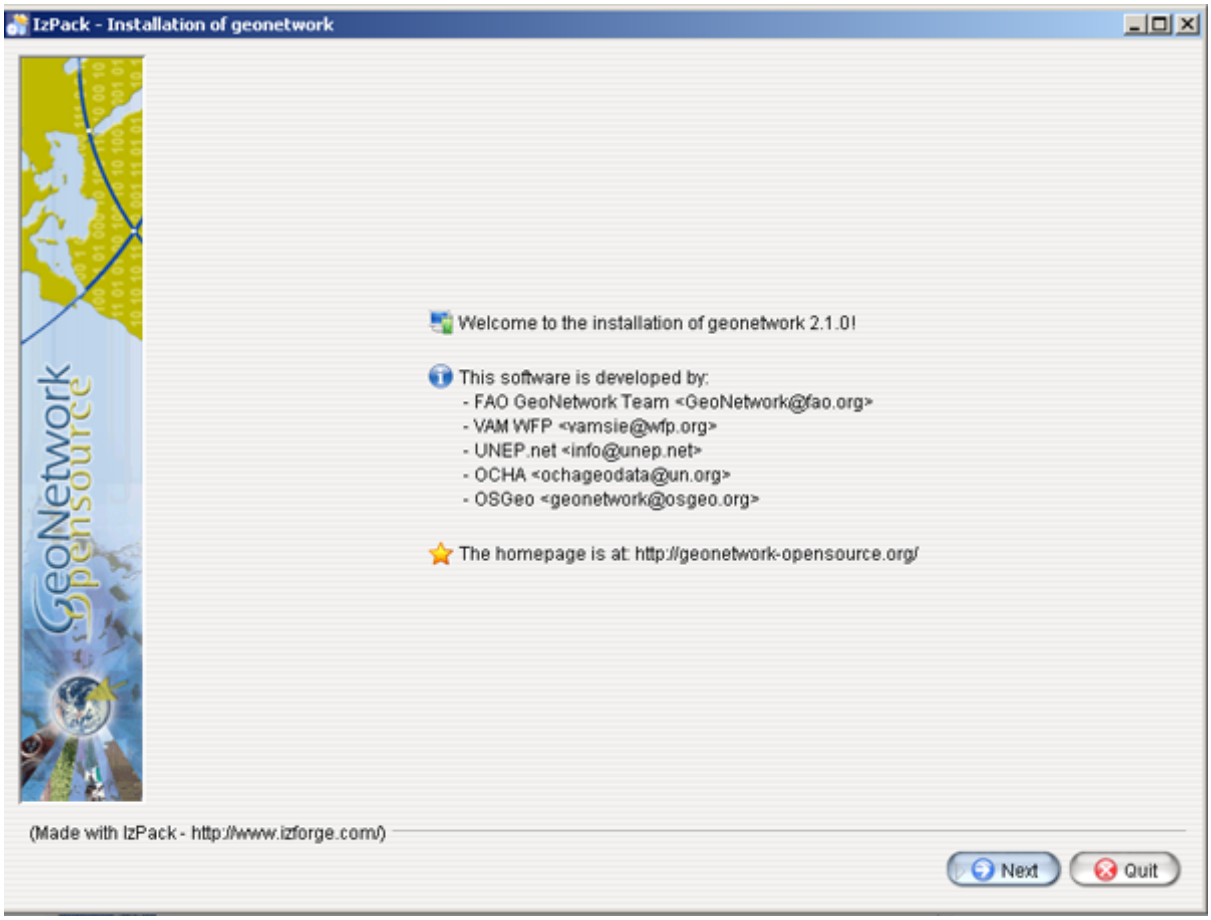



Figure 2.52: *Installer*

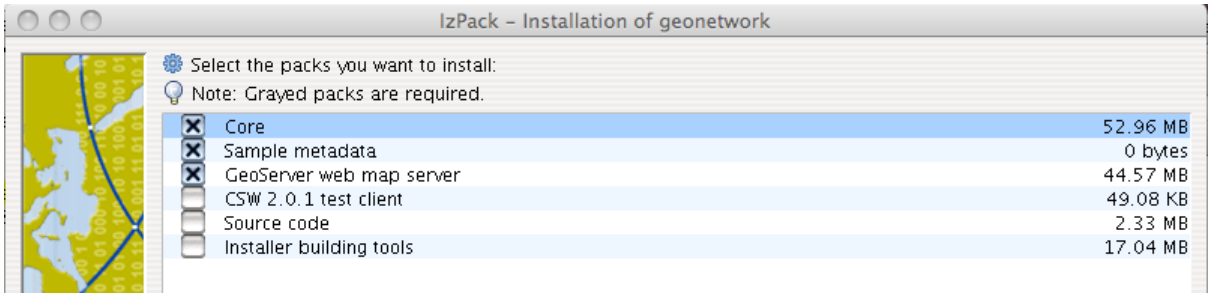

IzPack - Installation of geonetwork
Select the packs you want to install:
Note: Grayed packs are required.
Core 52.96 MB
Sample metadata 0 bytes
GeoServer web map server 44.57 MB
CSW 2.0.1 test client 49.08 KB
Source code 2.33 MB
Installer building tools 17.04 MB

Figure 2.53: *Packages to be installed*

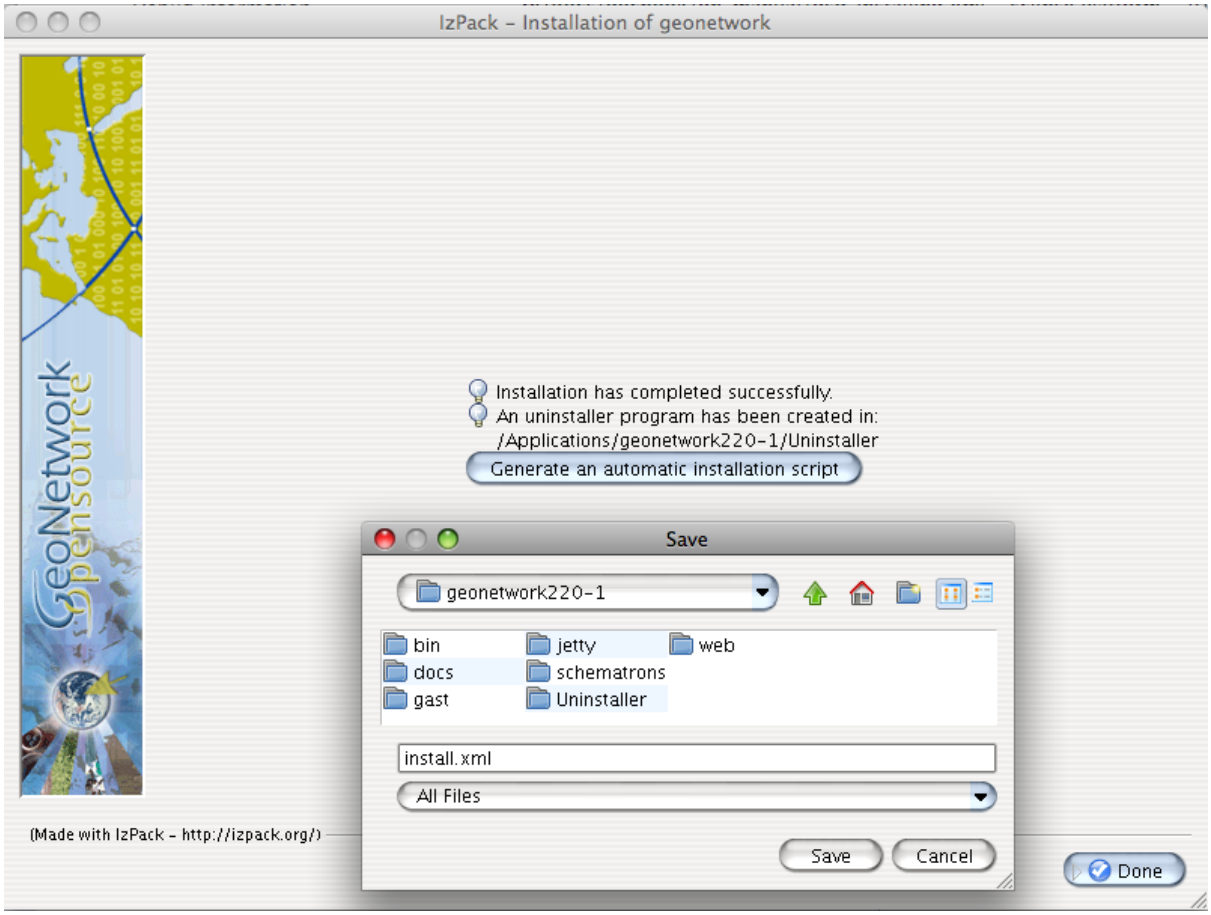



Figure 2.54: *Save the installation script for commandline installations*

```
[ Writing the uninstaller data ... ]
[ Automated installation done ]
```

You can also run the installation with lots of debug output. To do so run the installer with the flag *-DTRACE=true*:

```
java -DTRACE=true -jar geonetwork-install-2.6.0-0.jar
```

### 2.8.5 XSLT processor configuration

The file `INSTALL_DIR/web/geonetwork/WEB-INF/classes/META-INF/javax.xml.transform.Tra` defines the XSL processor to use in GeoNetwork. The allowed values are:

1. `de.fzi.dbs.xml.transform.CachingTransformerFactory` for XSL caching (recommended value for production use). When caching is on, only the main XSL stylesheet last update date is checked and not all included XSL. If you update an included stylesheet, cache is still used.
2. `net.sf.saxon.TransformerFactoryImpl` to use Saxon

GeoNetwork sets the XSLT processor configuration on the JVM system properties at startup time for an instant to obtain its TransformerFactory implementation, then resets it to original value, to minimize affect the XSL processor configuration for other applications.

CHAPTER 3

# Administration

## 3.1 Basic configuration

### 3.1.1 System configuration

Most of the GeoNetwork system configuration parameters can be changed using the web interface. Those parameters that cannot be changed through the web interface can usually be changed using the GAST application.

**Important:** Configuration of these parameters is critically important for a proper functioning of the GeoNetwork catalogue in an operational context. Failing to properly change these settings may result in a system that does not function as expected. For example, downloads may fail to be correctly processed, or metadata harvesting from other servers may not work.

To get to the System configuration, you must be logged on as administrator first. Open the Administration page and select System configuration (The link is surrounded with a red rectangle).

**Important:** New installations of GeoNetwork use admin for both username and password. It is important to change this from the Administration page once you logged on!

Clicking the page's link you will get the set of parameters that you can change. Here follows a detailed description of them:

At the bottom of the page there are some buttons with the following purpose:

Back Simply returns to the main administration page. Save Saves the current options. If some options are invalid, the system will show a dialogue with the wrong parameter and will focus its text field on the page. Once the configuration is saved a success dialogue will be shown. Refresh This button simply refreshes the displayed options taking the new values from the server. This can be useful if some options get changed dynamically (for example by another user).

Public host and port usage

Up to now, the server's host and port are used in these cases:

1. During an editing session, when adding data links to a metadata. The host and port will be used to build download links to store inside the metadata.
2. During CSW requests. The GetCapabilities operation returns an XML document with HTTP links to the CSW services. These links are dynamically built using the host and port values.

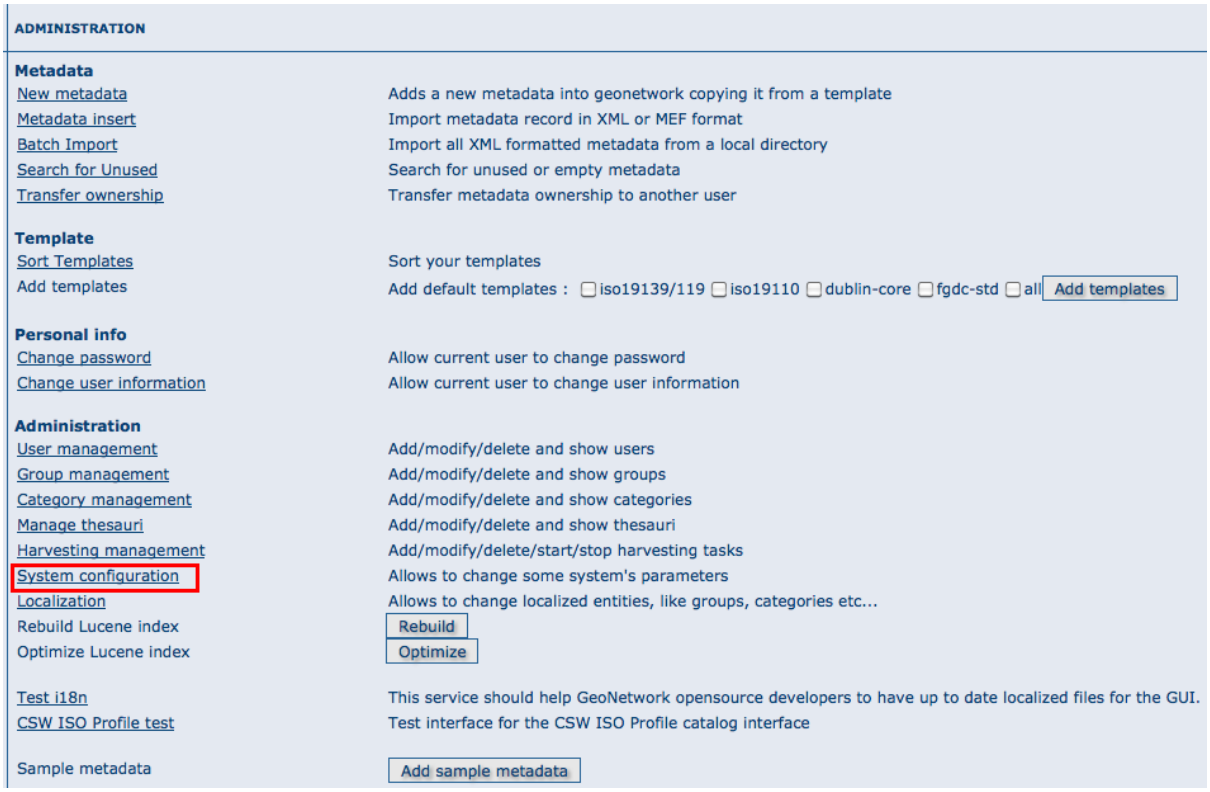



Figure 3.1: *The link to the System configuration page*

### Site General site parameters

*Name* The name of the GeoNetwork installation. This name will be used to identify the node in operations like the harvesting.

*Organization* The organization the node belongs to. Just for informative reasons.

*Server* Here you have to enter the address of your GeoNetwork's node. This address is important because it will be used to access the node.

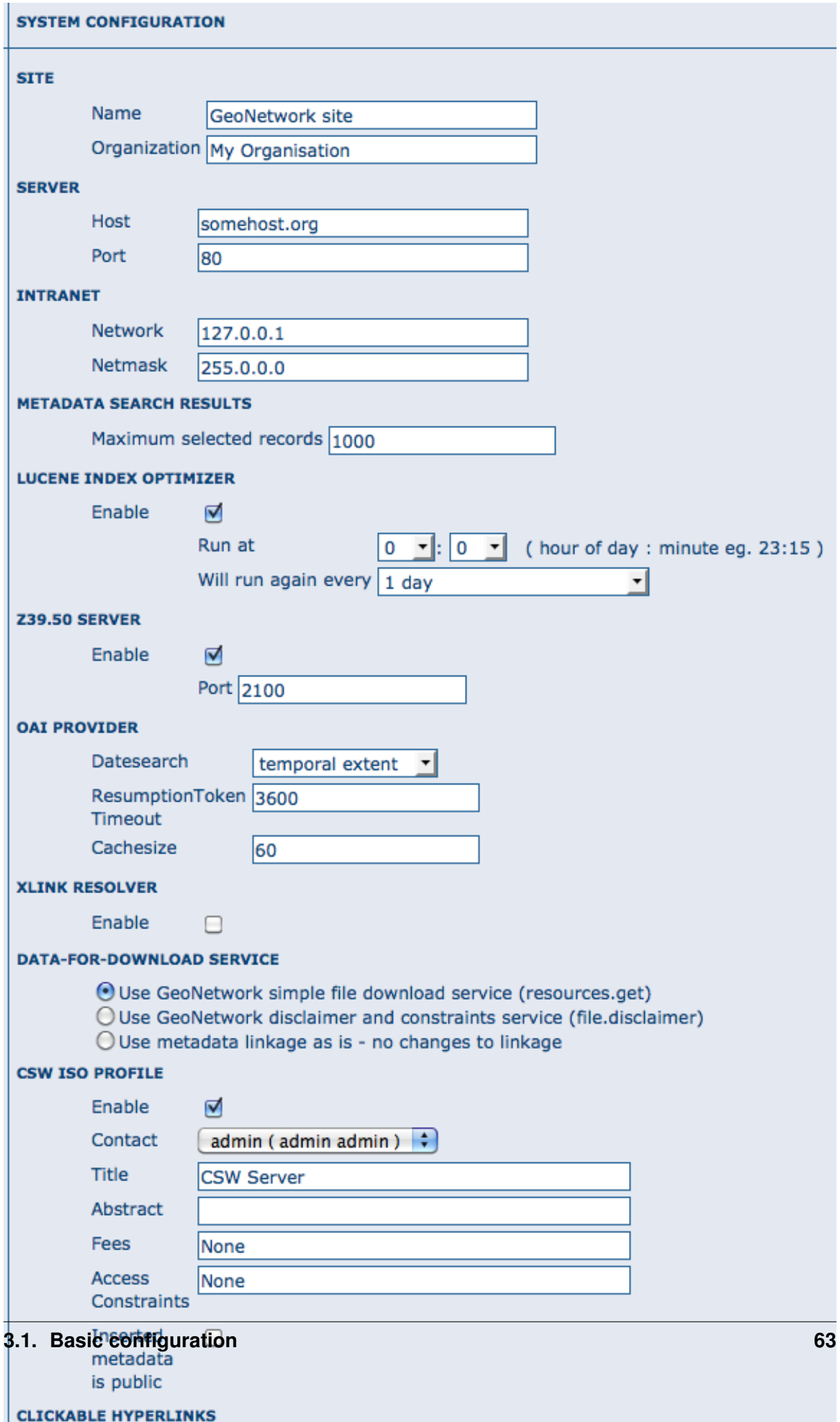
*Host* The node's address or IP number. If your node is publicly accessible from the Internet, you have to use the machine's domain/address. If your node is hidden into your private network and you have a firewall or web server that redirects incoming calls to the node, you have to enter the public address of the firewall or web server. A typical configuration is to have an Apache web server on address A that is publicly accessible and redirects the requests to a Tomcat server on a private address B. In this case you have to enter A in the host parameter.

*Port* The node's port (usually 80 or 8080). If the node is hidden, you have to enter the port on the public firewall or web server.

*Intranet* A common need for an organisation is to discriminate between internal anonymous users (users that access the node from within the organisation) and external ones (users from the Internet). Node's administrators can specify different privileges for internal and external anonymous users and, in order to do so, they have to specify the parameters of the internal network.

*Network* The internal network's address in IP form.

*Netmask* The network's mask.


SYSTEM CONFIGURATION
SITE
Name
GeoNetwork site
Organization
My Organisation
SERVER
Host
somehost.org
Port
80
INTRANET
Network
127.0.0.1
Netmask
255.0.0.0
METADATA SEARCH RESULTS
Maximum selected records
1000
LUCENE INDEX OPTIMIZER
Enable
Run at
0
0
( hour of day : minute eg. 23:15 )
Will run again every
1 day
Z39.50 SERVER
Enable
Port
2100
OAI PROVIDER
Datesearch
temporal extent
ResumptionToken Timeout
3600
Cachesize
60
XLINK RESOLVER
Enable
DATA-FOR-DOWNLOAD SERVICE
Use GeoNetwork simple file download service (resources.get)
Use GeoNetwork disclaimer and constraints service (file.disclaimer)
Use metadata linkage as is - no changes to linkage
CSW ISO PROFILE
Enable
Contact
admin ( admin admin )
Title
CSW Server
Abstract
Fees
None
Access Constraints
None
metadata is public
CLICKABLE HYPERLINKS

### Catalogue services (CSW, Z39.50)

## OGC CSW configuration

See *OGC CSW Server configuration*

## Z39.50 configuration

*Z39.50*: GeoNetwork can act as a Z39.50 server, which is an OGC communication protocol to query and retrieve metadata.

*Enable*: Check this option to start the Z39.50 submodule. Please, notice that GeoNetwork must be restarted in order to make this change active.

*port*: This is the port on which GeoNetwork will be listening for incoming Z39.50 requests. Usually, the value of 2100 is a standard one, but to have multiple GeoNetwork nodes on the same machine you have to change this value in order to avoid port conflicts between the different nodes.

### XLink resolver

Enables/disables the XLink resolver. XLink resolver replaces content of the elements with attribute @xlink:href (except for srv:operatesOn element) with the referenced content. The XLink resolver is used for example in Metadata fragments harvester to retrieve the metadata fragments referenced in the metadata and insert in it.

### Clickable hyperlinks

Enables/disables hyperlinks in metadata content for urls.

### INSPIRE

Enables/disables the INSPIRE search options in advanced search panel.

### Proxy configuration

*Proxy*: In some occasions (like harvesting) GeoNetwork must be able to connect to remote sites and this may be denied if an organisation uses proxy servers. In this cases, GeoNetwork must be configured to use the proxy server in order to route outgoing requests.

*Host*: The proxy's name or address to use (usually an IP address).

*Port*: The proxy's port to use.

*Username* (optional): a username should be provided if the proxy server requires authentication.

*Password* (optional): a password should be provided if the proxy server requires authentication.

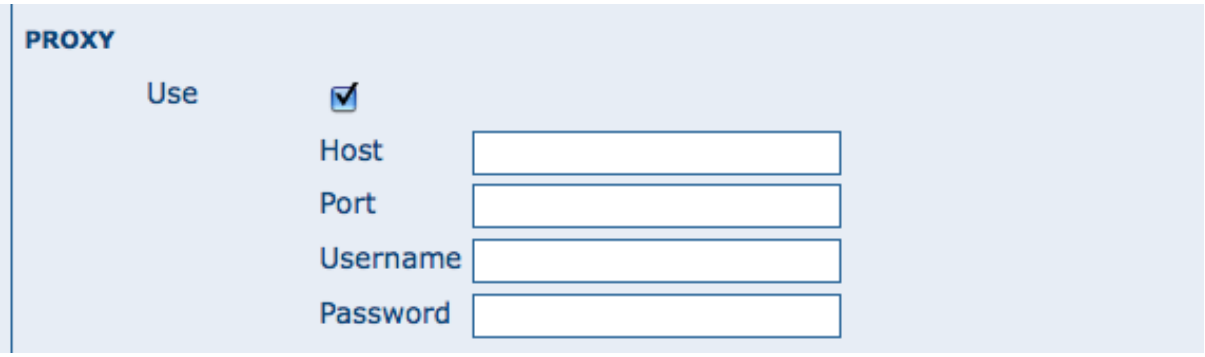



Figure 3.3: *The proxy configuration options*

### Email & notification

*Feedback* GeoNetwork can sometimes send email, for example if a metadata is downloaded or if a user provides feedback using the online form. You have to configure the mail server GeoNetwork should use in order to enable it to send email.

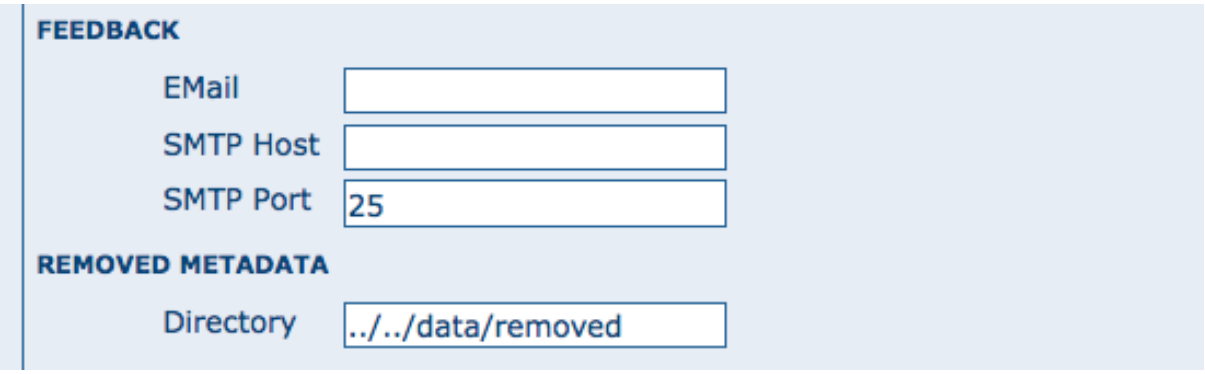



Figure 3.4: *The mail server configuration options*

*Email*: This is the email address that will be used to send the email (the From address).

*SMTP host*: the mail server address to use when sending email.

*SMTP port*: the mail server SMTP port (usually 25).

### Removed metadata

Defines the directory used to store a backup of metadata and data after a delete action. This directory is used as a backup directory to allow system administrators to recover metadata and possibly related data after erroneous deletion. By default the removed directory is created under the data folder

### Authentication

In this section you define the source against which GeoNetwork will authenticate users and passwords.

By default, users are authenticated against info held in the GeoNetwork database. When the GeoNetwork database is used as the authentication source, the user self-registation function can be enabled.

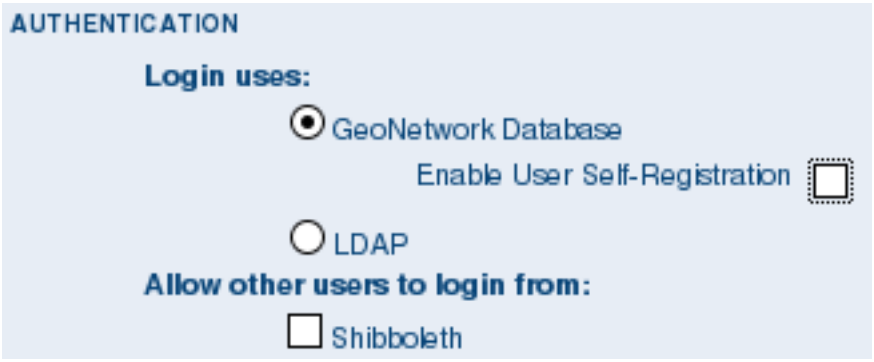



Figure 3.5: *Authentication configuration options*

You may choose to authenticate logins against either the GeoNetwork database tables or LDAP (the lightweight directory access protocol) but not both. The next section describes how to authenticate against LDAP.

In addition to either of these options, you may also configure other authentication sources. At present, Shibboleth is the only additional authentication source that can be configured. Shibboleth is typically used for national access federations such as the Australian Access Federation. Configuring shibboleth authentication in GeoNetwork to use such a federation would allow not only users from a local database or LDAP directory to use your installation, but any user from such a federation.

## LDAP Authentication

The section defines how to connect to an LDAP authentication system.

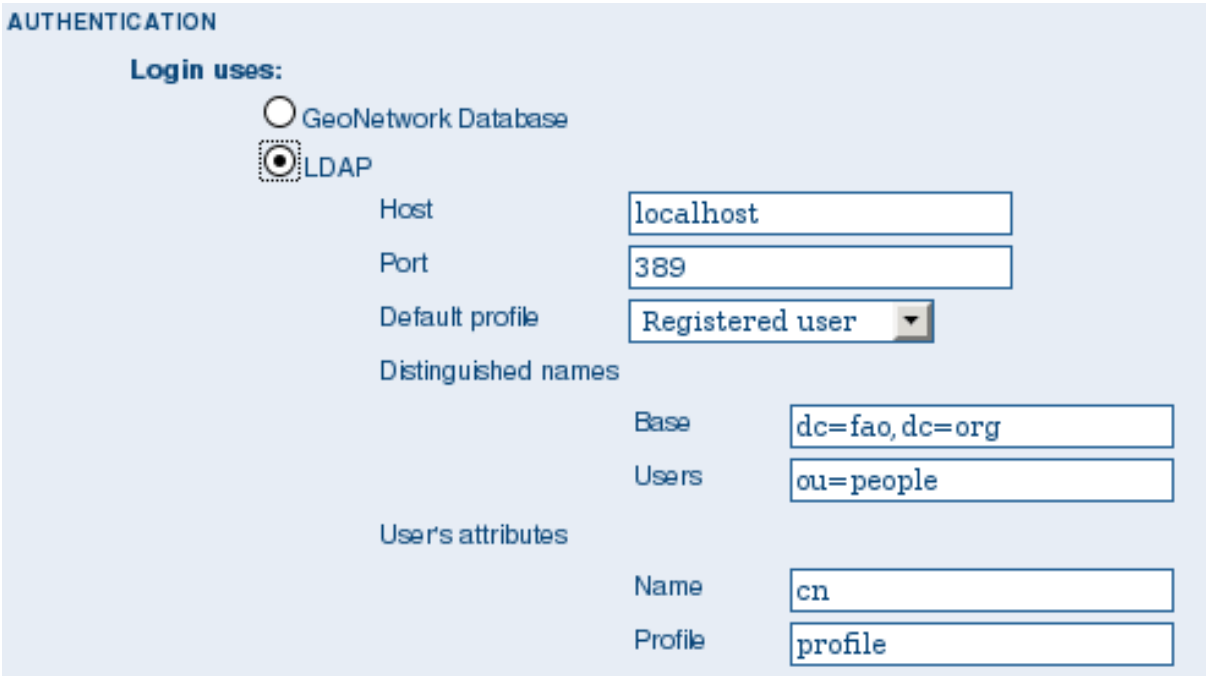



Figure 3.6: *The LDAP configuration options*

Typically all users must have their details in the LDAP directory to login to GeoNetwork. However if a user is added to the GeoNetwork database with the Administrator profile then they will be able to login

without their details being present in the LDAP directory.

### Shibboleth Authentication

When using either the GeoNetwork database or LDAP for authentication, you can also configure shibboleth to allow authentication against access federations.

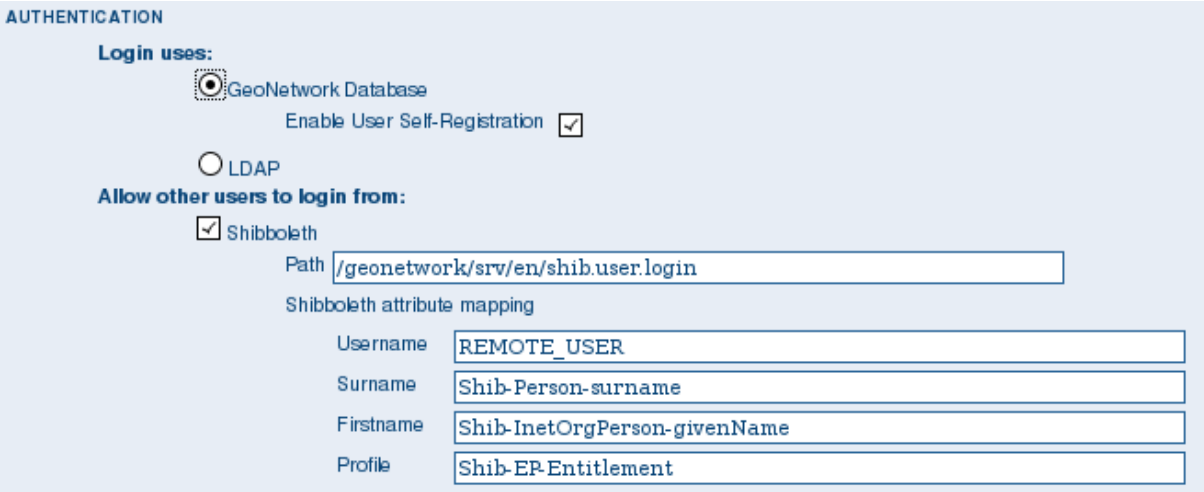



Figure 3.7: *The Shibboleth configuration options*

Shibboleth authentication requires interaction with Apache web server. In particular, the apache web server must be configured to require Shibboleth authentication to access the path entered in the configuration. The apache web server configuration will contain the details of the shibboleth server that works out where a user is located (sometimes called a 'where are you from' server).

The remainder of the shibboleth login configuration describes how shibboleth authentication attributes are mapped to GeoNetwork user database fields as once a user is authenticated against shibboleth, their details are copied to the local GeoNetwork database.

## 3.2 User and Group Administration

GeoNetwork uses the concept of Users, Groups and User Profiles. A User can be part of several Groups. A User also has a User Profile

A User can only have one User Profile associated. The combination of User Profile and Group defines what tasks the User can perform on the system or on specific metadata records.

### 3.2.1 Creating new user Groups

The administrator can create new groups of users. User groups can correspond to logical units within an organisation. For example groups for Fisheries, Agriculture, Land and Water, Health etcetera.

To create new groups you should be logged on with an account that has administrative privileges. To log in, simply go to the home page and enter your username and password in the top right corner fields, then click on the login button.

**Warning:** New installations of GeoNetwork use *admin* for both username and password. It is important to change this from the Administration page once you logged on!

Figure 3.8: *Login form*

1. Select the Administration button in the menu. On the Administration page, select Group management.

Figure 3.9: *Administration page*

2. Select *Add a new group*. You may want to rename or remove the *Sample* group;

3. Fill out the details. The email address will be used to send feedback on data downloads when they occur for resources that are part of the Group.

4. Click on *Save*

**Warning:** The Name should *NOT* contain spaces! You can use the Localisation functions to provide localised names for groups.

GROUP MANAGEMENT
Important! This form allows you to add a Key value to the database. The key can not have spaces. After adding your key values, use the "Localization" form in the Administration panel to provide the actual name you want to be displayed on the website for the different languages.
Name
Description
Operation
sample
Edit
Delete
Back
Add a new group

Figure 3.10: *Group management*

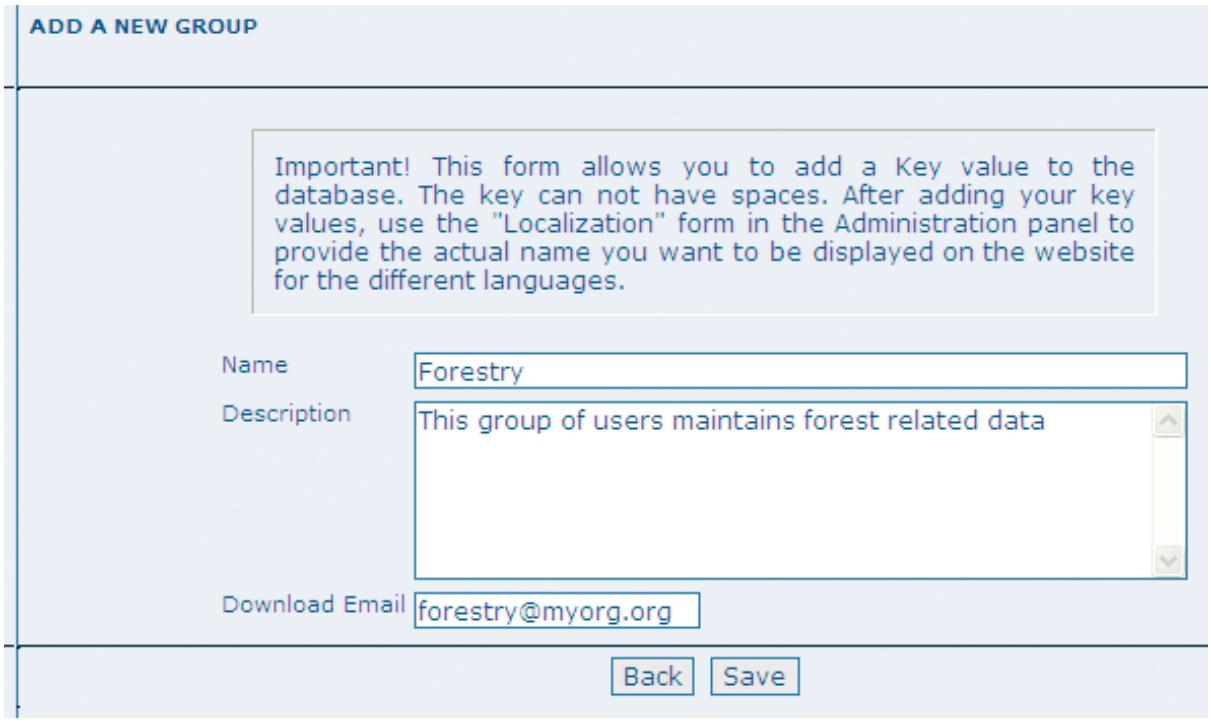

ADD A NEW GROUP
Important! This form allows you to add a Key value to the database. The key can not have spaces. After adding your key values, use the "Localization" form in the Administration panel to provide the actual name you want to be displayed on the website for the different languages.
Name
Forestry
Description
This group of users maintains forest related data
Download Email
forestry@myorg.org
Back
Save

Figure 3.11: *Group edit form*

Access privileges can be set per metadata record. You can define privileges on a per Group basis. Privileges that can be set relate to visibility of the Metadata (*Publish*), data Download, Interactive Map access and display of the record in the Featured section of the home page.

Editing defines the groups for which editors can edit the metadata record.

Notify defines what groups are notified when a file managed by GeoNetwork is downloaded.

Below is an example of the privileges management table related to a dataset.

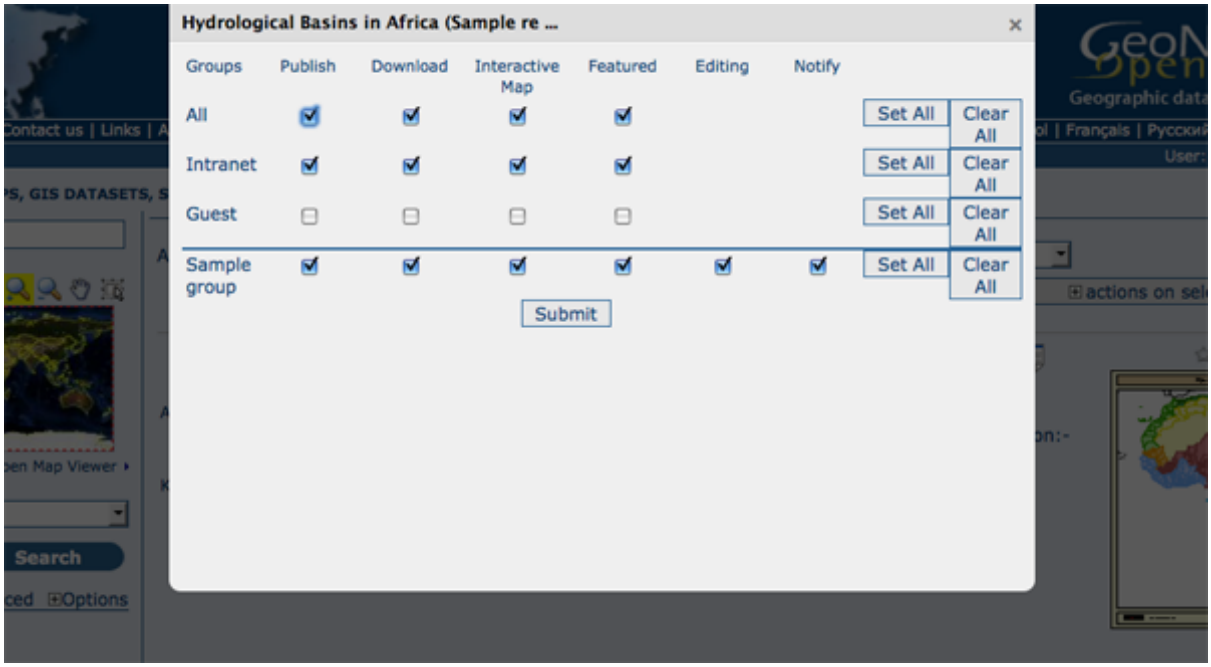



Figure 3.12: *Privilege settings*

### 3.2.2 Creating new Users

To add a new user to the GeoNetwork system you do the following:

1. Select *User Management* from the Administration link in the toolbar;
2. Click the button *Add a new user*;

1. Provide the *information* required for the new user;

1. Assign the correct *profile*;
2. Assign the user to a *group*;
3. Click on *Save*.

### 3.2.3 User Profiles

Users can have different profiles depending on their role in the GeoNetwork system. A profile defines what tasks the user can perform.

Figure 3.13: *User administration form*

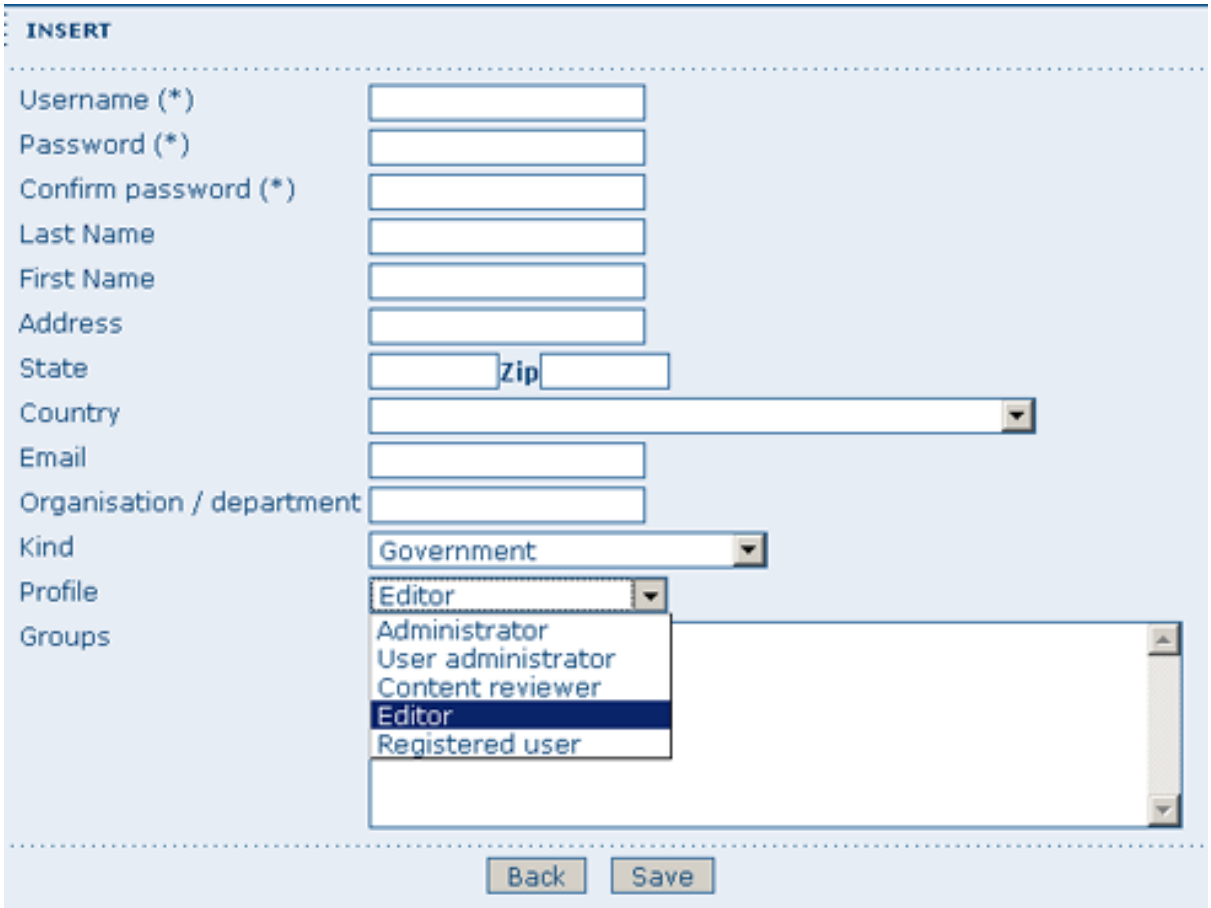



Figure 3.14: *User information form*

User profiles are hierarchical and based on inheritance. This means that a user with an Editor profile can create and modify new metadata records, but can also use all functions a Registered user can use.

Rights associated with the profiles are illustrated in detail in the list below:

1. Administrator Profile

   The Administrator has special privileges that give access to all available functions. These include:

   - Full rights for creating new groups and new users
   - Rights to change users/groups' profiles
   - Full rights for creating/editing/deleting new/old metadata
   - Perform system administration and configuration tasks.

2. User Administrator Profile

   The User Administrator is the administrator of his/her own group with the following privileges:

   - Full rights on creating new users within the own group
   - Rights to change users profiles within the own group
   - Full rights on creating/editing/ deleting new/old data within the own group

3. Content Reviewer Profile

   The content reviewer is the only person allowed to give final clearance on the metadata publication on the Intranet and/or on the Internet:

   - Rights on reviewing metadata content within the own group and authorising its publication

4. Editor Profile

   The editor works on metadata with following privileges:

   - Full rights on creating/editing/ deleting new/old data within the own group

5. Registered User Profile

   The Registered User has more access privileges than non-authenticated Guest users:

   - Right to download protected data

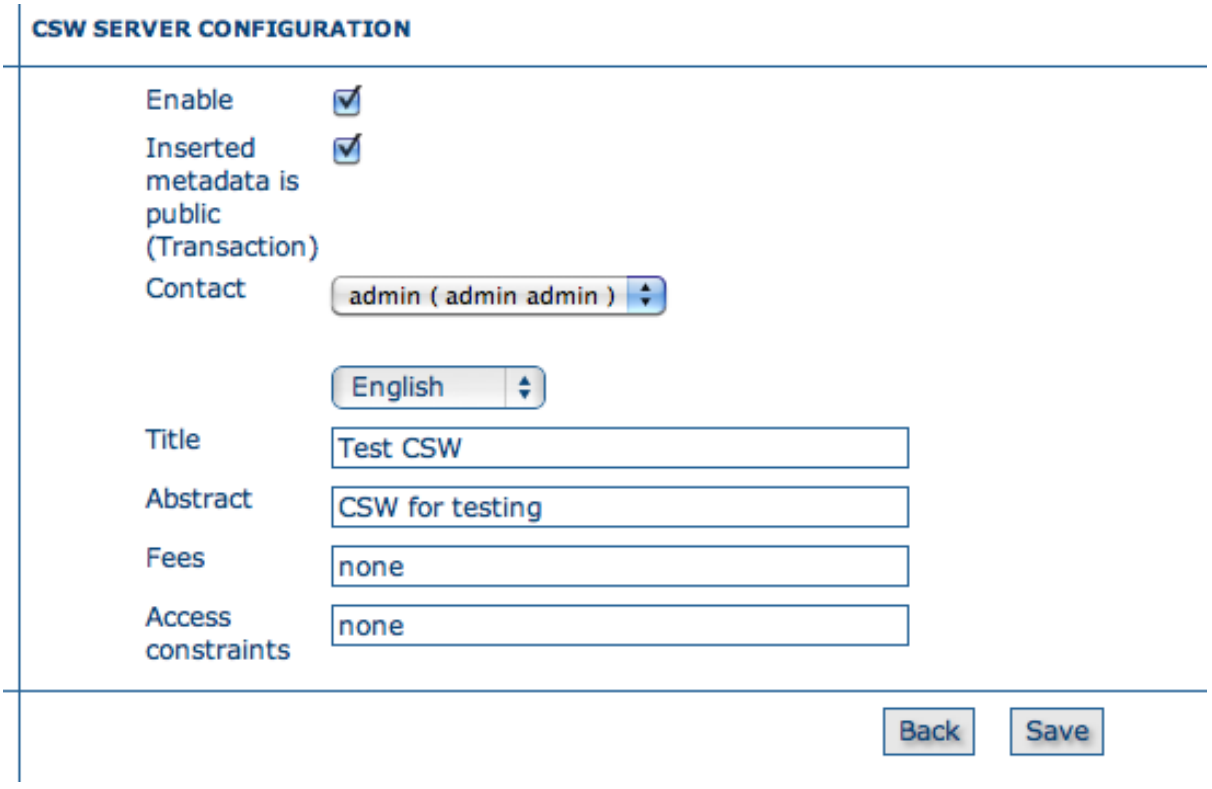
## 3.3 OGC CSW Server configuration

When using Open Geospatial Catalogue Service for the Web (OGC-CSW) service, a client will ask for a description of the service. This description, provided in the form of a GetCapabilities document, describes the main service's properties.

The CSW server section allows configuration of the following CSW properties:

- *Enable*: This option allows you to start or stop the CSW services. If this option is disabled, other catalogues cannot connect to the node using CSW protocol.
- *Inserted metadata is public*: By default, metadata inserted with CSW Transaction operation is not public viewable unless a user with proper rights, sets later the metadata permissions to be public viewable. If this option is checked all metatada inserted with CSW Transation is public viewable by default.

ADMINISTRATION
Metadata
New metadata
Adds a new metadata into geonetwork copying it from a template
Metadata insert
Import metadata record in XML or MEF format
Batch Import
Import all XML formatted metadata from a local directory
Search for Unused
Search for unused or empty metadata
My Metadata
my metadata
Transfer ownership
Transfer metadata ownership to another user
Template
Sort Templates
Sort your templates
Add templates
Add default templates : iso19139/119 iso19110 dublin-core fgdc-std all Add templates
Personal info
Change password
Allow current user to change password
Change user information
Allow current user to change user information
Administration
User management
Add/modify/delete and show users
Group management
Add/modify/delete and show groups
Category management
Add/modify/delete and show categories
Manage thesauri
Add/modify/delete and show thesauri
Harvesting management
Add/modify/delete/start/stop harvesting tasks
System configuration
Allows to change some system's parameters
notifications
remote updates
Localization
Allows to change localized entities, like groups, categories etc...
Stopwords
You can define the languages for which stopwords are used.
CSW server
CSW Server configuration
Rebuild Lucene index
Rebuild
Optimize Lucene index
Optimize
Test i18n
This service should help GeoNetwork opensource developers to have up to date localized files for the GUI.
CSW ISO Profile test
Test interface for the CSW ISO Profile catalog interface
Sample metadata
Add sample metadata


CSW SERVER CONFIGURATION
Enable
Inserted metadata is public (Transaction)
Contact
admin ( admin admin )
English
Title
Test CSW
Abstract
CSW for testing
Fees
none
Access constraints
none
Back
Save

- *Contact*: The main contact who is defined in the GetCapabilities document of the CSW service. This contact is one user of the catalogue.
- *Title*: The title of your CSW service.
- *Abstract*: The abstract of your CSW service.
- *Fees*
- *Access constraints*

The properties *Title*, *Abstract*, *Fees* and *Access constraints* can be configured in the languages supported by GeoNetwork GUI. When the user asks for the Capabilities document the values are returned in the language used in the URL:

- `http://SERVER/geonetwork/srv/en/csw?request=GetCapabilities&...` , returns the Capabilities document with english values
- `http://SERVER/geonetwork/srv/**fr**/csw?request=GetCapabilities&...` , returns the Capabilities document with french values

When INSPIRE is enabled and is provided the language parameter in the Capabilities URL it is used the value of this parameter. For example:

- `http://SERVER/geonetwork/srv/fr/csw?request=GetCapabilities&...&language=eng` , returns the Capabilities document with english values

The service description also contains the main keywords of the catalogue. The list of keywords is generated by the catalogue based on metadata content.

## 3.4 Import facilities

### 3.4.1 File import

The file import facility allows you to import metadata records in XML format or MEF format or copy/paste XML metadata to insert. In order to use this facility, you have to be logged in as an editor. After the login step, go to the administration page and select the Metadata insert link.

Clicking the link, you will open the metadata import page. You have to specify a set of parameters to make the import working. Depending on the insert type you will perform:

#### XML file import

For both, XML and MEF file import, you could choose actions to be performed at import. Import actions options are: *No action on import* (nothing done during import process), *Overwrite metadata with same UUID* (this option will delete existing metadata with the same UUID, and add the new one), *Generate UUID for inserted metadata* (this option will force a new UUID for each metadata inserted).

Stylesheet option: This is a powerful option because allows you to specify a stylesheet for an XSL transformation. The drop down control is filled with files taken from the web/xsl/conversion/import folder: all XSL files you put there will be made available. This is a dynamic process so you don't have to restart GeoNetwork. The purpose of this option is to allow the conversion of a metadata into a suitable format that is supported by GeoNetwork. Validate option: This is a simple validation step that you can choose to perform. The metadata is validated against its schema. Group option: You have to select a group to associate to the imported metadata. Usually the group is the creator of the metadata

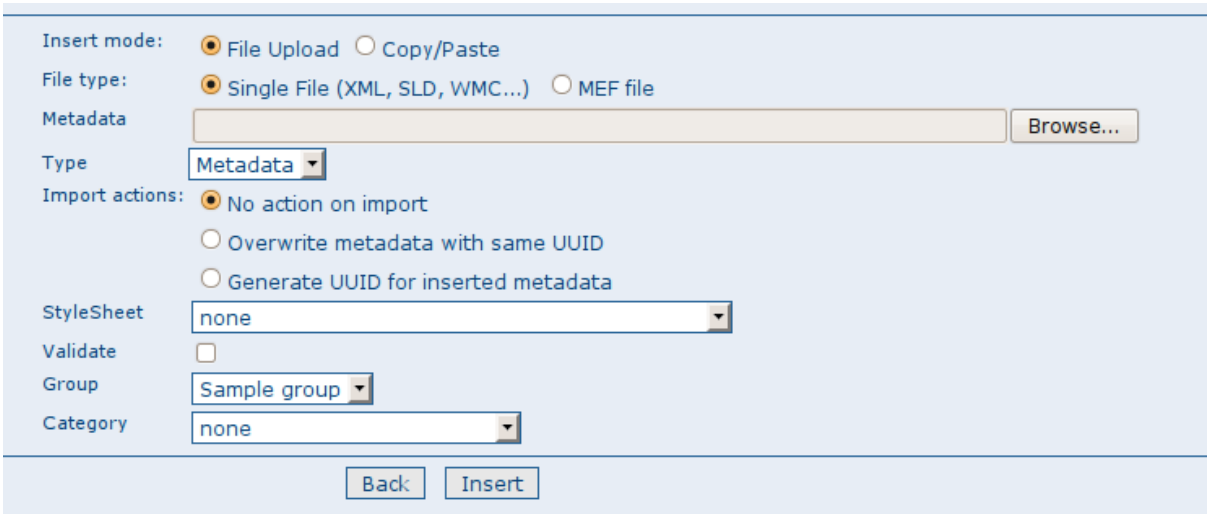



Figure 3.15: *The XML file import options*

set. Category option: You can specify one category to associate to your metadata in order to simplify the search.

#### MEF file import

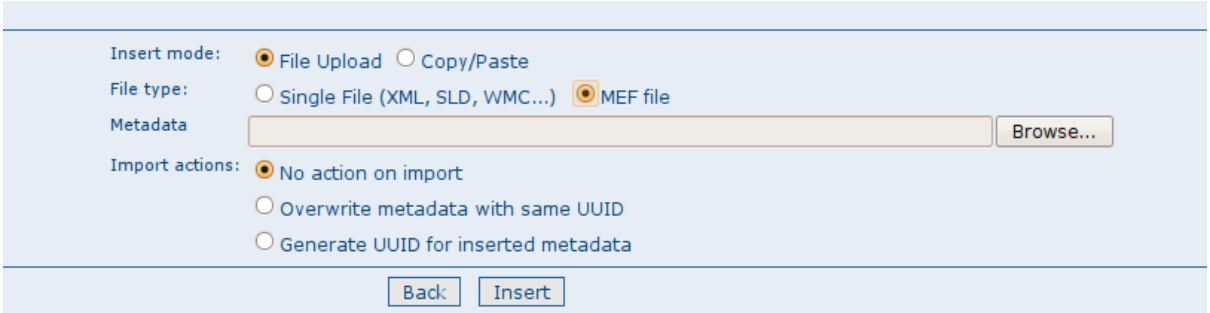



Figure 3.16: *The MEF file import options*

As presented before, only actions options could be selected during a MEF import.

#### XML metadata insert

Choosing the radio button Copy/Paste, you could perform an XML insert, directly copy/pasting your metadata record. Please refer to XML import for options you could use.

### 3.4.2 Batch import

The batch import facility allows you to import a set of metadata into the system all at once. In order to use this facility, you have to be logged in as an administrator. After the login step, go to the administration page and select the batch import's link.

Clicking the link will open the batch import page. You have to specify a set of parameters to make the import working. They are:

Directory This is the full path on the server's file system of the directory to scan. GeoNetwork will look for and try to import all XML or MEF files present into this directory. It is important to notice that this is the directory on the *server* machine and *not* on the client of the user that is doing the import. Import actions options are also available from bacth import (please refer to XML import for options you could use). Validate This is a simple validation step that you can choose to perform. The metadata is validated against its schema. Group You have to select a group to associate to the imported metadata. Usually the group is the creator of the metadata set. Category You can specify one category to associate to your metadata in order to simplify the search. Stylesheet This is a powerful option because allows you to specify a stylesheet for an XSL transformation. The drop down control is filled with files taken from the web/xsl/conversion/import folder: all XSL files you put there will be made available. This is a dynamic process so you don't have to restart GeoNetwork. The purpose of this option is to allow the conversion of a metadata into a suitable format that is supported by GeoNetwork. Therefore, it is important that the result of the transformation matches the schema format selected above.

Below the page, there are the following buttons:

Back Goes back to the administration form. Upload Starts the import process. When the process ends, the total count of imported metadata will be shown. Please notice that the import is transactional: the

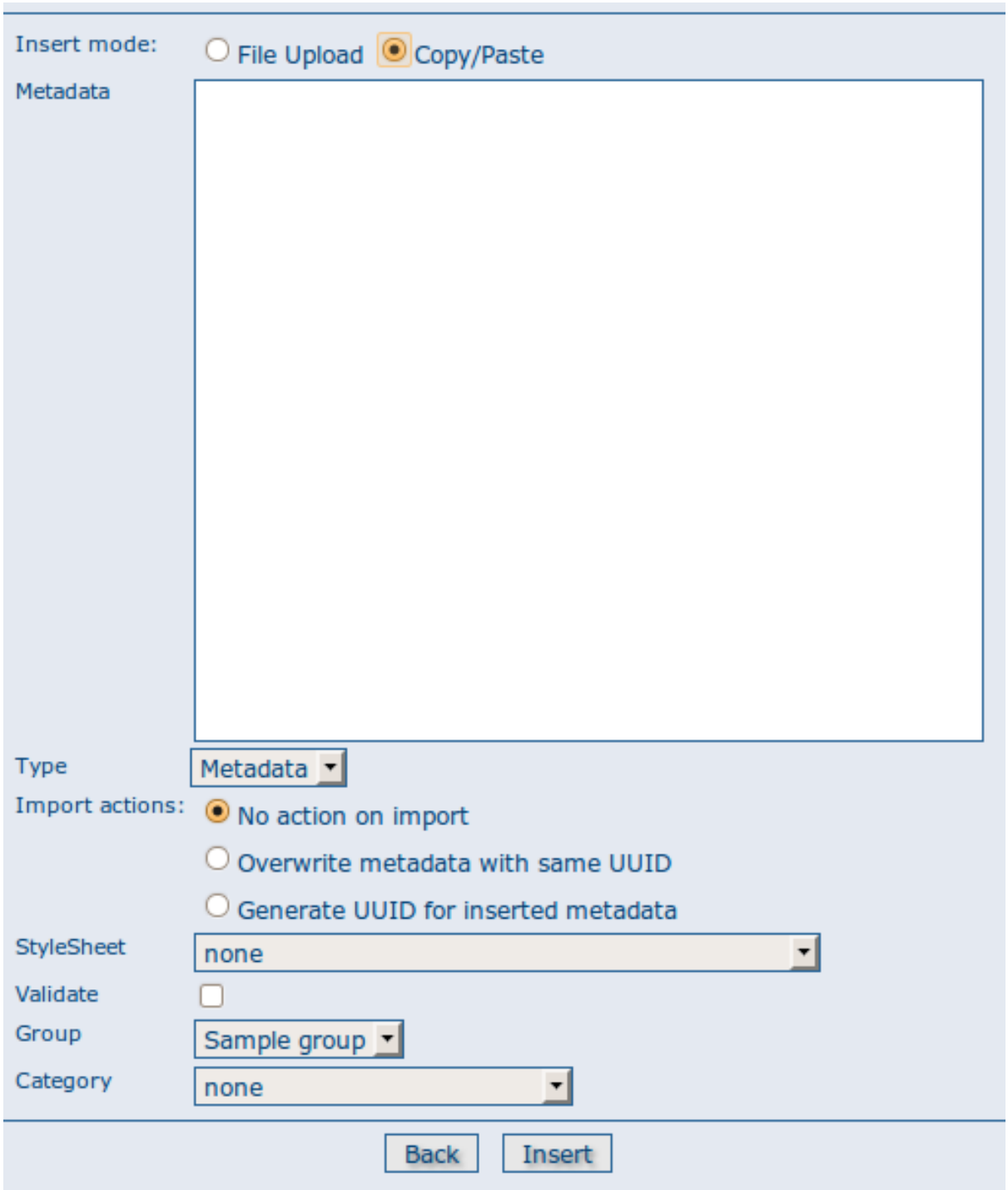



Figure 3.17: *The XML insert options*

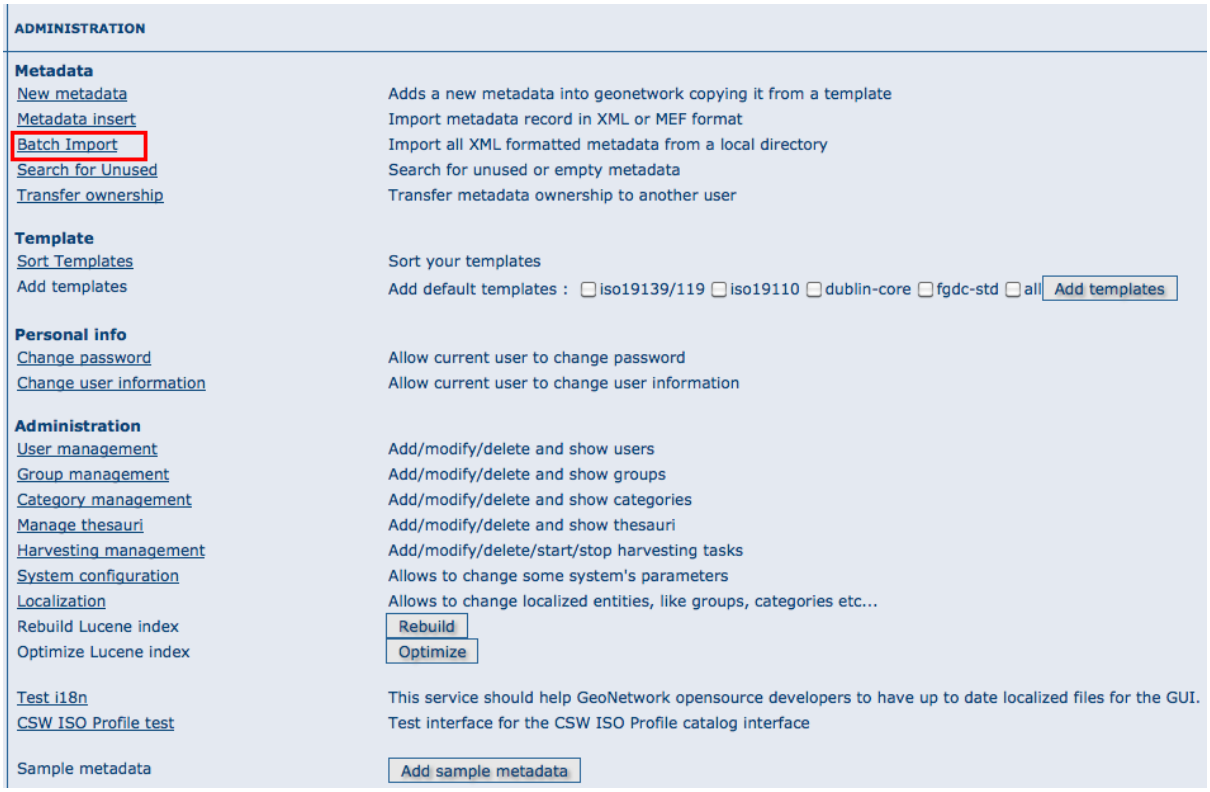



Figure 3.18: *How to reach the batch import page*

metadata set will be fully imported or fully discarded (there are no partial imports). Files that starts with '.' or that do not end with '.xml' are ignored.

### Structured import

An hidden feature of the batch import is the possibility to specify some import parameters in more detail. This feature is triggered when the specified folder contains the import-config.xml file. When this happen, this file is read and the standard import switches to the structured one.

The import-config.xml file has a config root element with the following children:

1. categoryMapping [1]: this element specifies the mapping of directories to categories.
   (a) mapping [0..n]: This element can appear 0 or more times and maps one directory name to a category name. It must have a dir attribute that indicates the directory and a to attribute that indicates the category name.
   (b) default [1]: This element specifies a default mapping of categories for all directories that do not match the other mapping elements. It must have only the to attribute.
2. schemaMapping [1]: this element specifies the mapping of directories to metadata schemas.
   (a) mapping [0..n]: This element can appear 0 or more times and maps one directory to the schema name that must be used when importing. The provided schema must match the one used by the metadata contained into the specified directory, which must all have the same schema. It must have a dir attribute that indicates the directory and a to attribute that indicates the schema name.

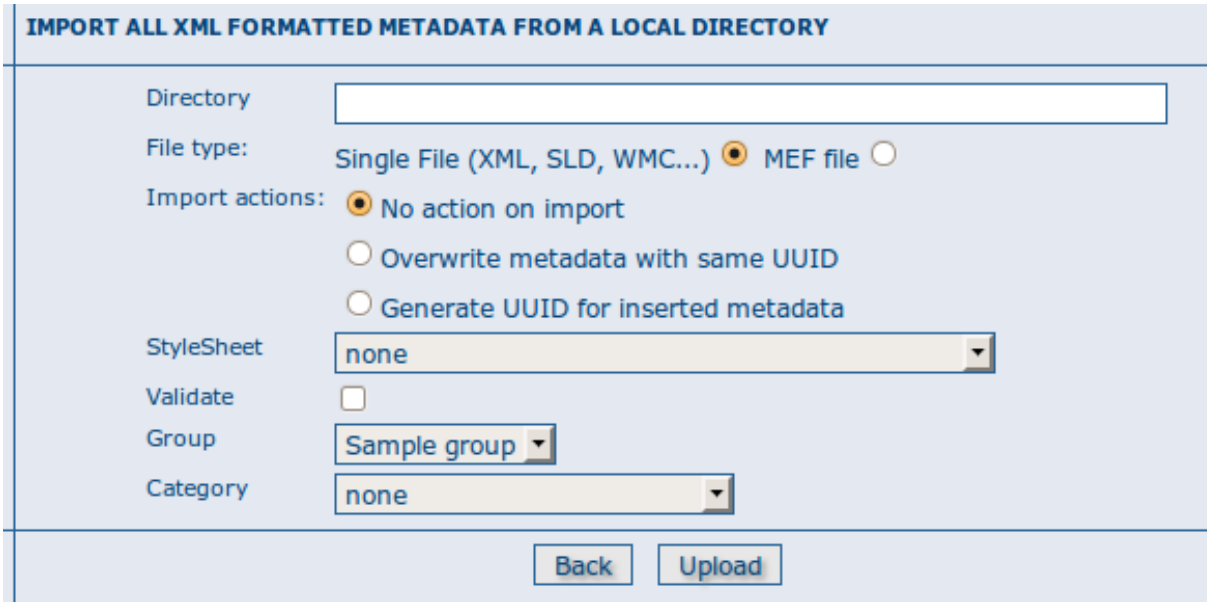



Figure 3.19: *The batch import options*

(b) default [1]: default behaviour to use when all other mapping elements do not match. It must have only the to attribute.

Here is an example of the import-config.xml file:

```
<config>
        <categoryMapping>
                <mapping dir="1" to="maps" />
                <mapping dir="3" to="datasets" />
                <mapping dir="6" to="interactiveResources" />
                <mapping dir="30" to="photo" />
                <default to="maps" />
        </categoryMapping>
        <schemaMapping>
                <mapping dir="3" to="fgdc-std" />
                <default to="dublin-core" />
        </schemaMapping>
</config>
```

The import procedure starts by scanning the provided directory. This can contain, beside the import-config.xml file, only subdirectories which name will be ignored but used only as a container. Inside each directory, there is another level made only by directories that represent a metadata grouping for categories. Each directory name will be used as the dir attribute in the mapping scheme previously described.

## 3.5 Harvesting

### 3.5.1 Introduction

Since the beginning of the project, there has been the need to share metadata among several GeoNetwork nodes. Usually, each node takes care of a region of interest so it is important to be able to perform a search over all these nodes at the same time. This is called distributed search and exploits the Internet

connectivity. In our cases, this distributed search can be heavy to perform if there are many maps with associated thumbnails. Furthermore, GeoNetwork is usually employed in areas (like Africa, Asia) where the connectivity can be limited, making the use of distributed search not feasible.

Harvesting is the process of collecting remote metadata and storing them locally for a faster access. This is a periodic process to do, for example, once a week. Harvesting is not a simple import: local and remote metadata are kept aligned. Using some *magic*, one GeoNetwork node is capable of discovering metadata that have been added, removed or updated in the remote node.

GeoNetwork is able to harvest from the following sources (for more details see below):

1. Another GeoNetwork node (version 2.1 or above).
2. An old GeoNetwork 2.0 node.
3. A WebDAV server.
4. A CSW 2.0.1 or 2.0.2 catalogue server.
5. An OAI-PMH server.
6. An OGC service using its GetCapabilities document. These include WMS, WFS, WPS and WCS services.
7. An ArcSDE server.
8. An ISRIC metadata server.

### 3.5.2 Mechanism overview

The harvesting mechanism is based on the concept of a *universally unique identifier (UUID)*. This is a special id because it is not only unique locally to the node that generated it but it is unique across all the world. It is a combination of the network interface's MAC address, the current date/time and a random number. Every time you create a new metadata in GeoNetwork, a new UUID is generated and assigned to it.

Another important concept behind the harvesting is the *last change date*. Every time you change a metadata, its last change date is updated. Just storing this parameter and comparing it with a new one allows any system to find out if the metadata has been modified since last update.

These two concepts allow GeoNetwork to fetch a remote metadata, check if it has been updated and remove it locally if it has been removed remotely. Furthermore, thanks to UUIDs, a hierarchy of harvesting nodes can be built where B harvests from C and A harvests from B. Even loops can be created because harvested metadata cannot be modified.

### 3.5.3 Harvesting life cycle

When a harvesting node is set, there is no harvested metadata. During the first run, all remote matching metadata are retrieved and stored locally. After the first run, only changed metadata are retrieved. Harvested metadata are not editable for the following reasons:

1. The harvesting is periodic so any local change to harvested metadata will be lost during the next run.
2. The change date is used to keep track of changes so if it gets changed outside the originator site, the harvesting mechanism is compromised.

Beside the metadata itself, this implies that users cannot change all other metadata properties (like categories, privileges etc...).

The harvesting process goes on until one of the following situations arises:

1. An administrator stops (deactivates) the node.
2. An exception arises. In this case the node is automatically stopped.

When a harvesting node is removed, all harvest metadata are removed too.

### 3.5.4 Multiple harvesting and hierarchies

Catalogues that provide UUIDs for metadata (for example GeoNetwork and a CSW server) can be harvested several times without having to take care about metadata overlap. This allows the possibility to perform a thematic search and a metadata belonging to multiple searches is harvested only once and not duplicated.

This mechanism allows the GeoNetwork harvesting type to be combined with other GeoNetwork nodes to perform hierarchical harvesting. This way a metadata can be harvested from several nodes. For example, consider this scenario:

1. Node (A) has created metadata (a)
2. Node (B) harvests (a) from (A)
3. Node (C) harvests (a) from (B)
4. Node (D) harvests from both (A), (B) and (C)

In this scenario, Node (D) will get the same metadata (a) from all 3 nodes (A), (B), (C). The metadata will flow to (D) following 3 different paths but thanks to its UUID only one copy will be stored. When (a) will be changed in (A), a new version will flow to (D) but, thanks to the change date, the copy in (D) will be updated with the most recent version.

### 3.5.5 General notes and issues

#### General

1. The harvesting engine does not store harvesting results. This implies that if the server is restarted the last results are lost.
2. Changes to the harvesting parameters (for example privileges and categories) are taken into account in the next harvesting run.

#### GeoNetwork harvesting type

1. During harvesting, site icons are harvested and local copies updated. Icons are propagated to new nodes as soon as these nodes harvest from this one.
2. The metadata UUID is taken from the info.xml file of the MEF bundle. Any UUID stored inside the metadata will be overwritten with this one.

#### WebDAV harvesting type

1. The same metadata could be harvested several times by different harvesting nodes. Anyway, this is not a good practise because every copy of the metadata will have a different UUID and the system will fill with different copies of the same metadata.

#### CSW harvesting type

1. If the dct:modified element is missing from the GetRecords response the metadata will be always harvested.
2. Any exception during getRecordById operation is discarded and the metadata skipped.

#### OAI-PMH harvesting type

1. The id of the remote server must be a UUID. If not, metadata can be harvested but during hierarchical propagation id clashes could corrupt harvested metadata.
2. During harvesting, GeoNetwork will try to auto detect the schema of each metadata. If the schema is not supported the metadata is skipped.

#### OGC service harvesting type

1. Every time the harvester runs, it will remove previously harvested information and create new ones. GeoNetwork will generate the id for all metadata (both service and datasets). Therefor, for datasets, if the metadata is created using a remote XML document (ie. if a MetadataUrl tag is in the GetCapability document), the UUID of the document is used.
2. Thumbnails are generated only for Web Map Service (WMS). The service should also support the WGS84 projection

#### ISRIC harvesting type

1. The metadata harvested in ISRIC format is transformed to ISO19139.
2. The UUID for harvested metadata is created from the ISRIC identifier and the server URL to guarantee unique UUID in case of harvesting from multiple servers where ISRIC identifier can be the same.

### 3.5.6 The main page

To access the harvesting main page you have to be logged in as an administrator. From the administration page, click the link shown below with a red rectangle.

The figure above shows the harvesting main page. The page shows a list of harvesting nodes that have been created so far. On the bottom side there is a set of buttons to manage these nodes. The meaning of each column is as follows:

1. *Select* This is just a check box to select one or more nodes. The selected nodes will be affected by the first row of buttons (start, stop, run, remove). For example, if you select 3 nodes and press the Remove button, these 3 nodes will be removed.

Figure 3.20: *How to access the harvesting main page*

2. *Name* This is the node's name provided by the administrator.
3. *Type* The node's harvesting type chosen when the node was created (GeoNetwork, web folder etc...).
4. *Status* This is an icon that reflects the node's current status. See *admin_harvesting_status* for all different icons and status description.
5. *Errors* This column reflects the status of the last harvesting run, which could have succeeded or not. The result is reflected on this icon and a tool tip will show detailed information.
6. *Every* The time (in days, hours, minutes) between two consecutive harvesting from this node.
7. *Last run* The date, in ISO 8601 format, of the most recent harvesting run.
8. *Operation* A list of buttons for all possible operations on a node.
9. Selecting *Edit* will allow you to change the parameters for a node.

The bottom side of the page contains two rows of buttons. The first row contains buttons that can operate on a set of nodes. You can select the nodes using the check box on the first column and then press the proper button. When the button finishes its action, the check boxes are cleared. Here is the meaning of each button:

1. *Activate* When a new harvesting node is created, it's status is *inactive*. Use this button to make it *active* and thus to start harvesting from the remote node.
2. *Deactivate* Stops harvesting from a node. Please notice that this does not mean that a currently running harvesting will be stopped but it means that this node will be ignored during future harvesting.

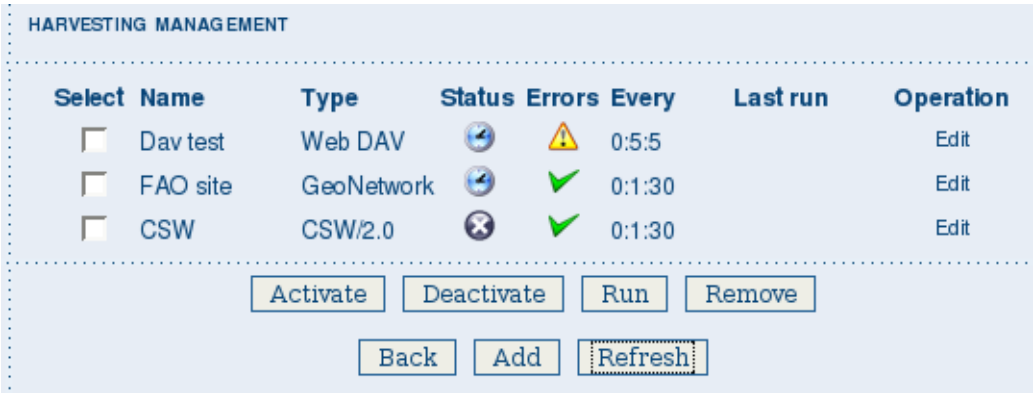



Figure 3.21: *The harvesting main page*

3. *Run* This button simply tells the harvesting engine to start harvesting immediately. This is useful for testing during the harvesting setup.
4. *Remove* Remove all currently selected nodes. A dialogue will ask the user to confirm the action.

The second row contains general purpose buttons. Here is the meaning of each button:

1. *Back* Simply returns to the main administration page.
2. *Add* This button allows to create new harvesting nodes.
3. *Refresh* Refreshes the current list of nodes querying the server. This can be useful to see if the harvesting list has been altered by someone else or if any harvesting process started.

| Icon | Status | Description |
|---|---|---|
| | Inactive | The harvesting from this node is stopped. |
| | Active | The harvesting engine is waiting for the timeout specified for this node. When the timeout is reached, the harvesting starts. |
| | Running | The harvesting engine is currently running, fetching metadata from remote nodes. When the process will be finished, the status will be switched to active. |

*Possible status icons*

| Icon | Description |
|---|---|
| | The harvesting was OK, no errors were found. In this case, a tool tip will show some harvesting results (like the number of harvested metadata etc...). |
| | The harvesting was aborted due to an unexpected condition. In this case, a tool tip will show some information about the error. |

*Possible error icons*

### Harvesting result tips

If the harvesting succeeds, a tool tip will show detailed information about the harvesting process. This way you can check if the harvester worked as expected or if there is something to fix to the harvesting parameters or somewhere else. The result tip is like a table, where each row refers to

Total This is the total number of metadata found remotely. Metadata with the same id are considered as one. Added Number of metadata added to the system because they were not present locally. Removed Number of metadata that have been removed locally because they are not present in the remote server anymore. Updated Number of metadata that are present locally but that needed to be updated because their last change date was different from the remote one. Unchanged Local metadata left unchanged. Their remote last change date did not change. Unknown schema Number of skipped metadata because their format was not recognised by GeoNetwork. Unretrievable Number of metadata that were ready to be retrieved from the remote server but for some reason there was an exception during the data transfer process. Bad Format Number of skipped metadata because they did not have a valid XML representation. Does not validate Number of metadata which did not validate against their schema. These metadata were harvested with success but skipped due to the validation process. Usually, there is an option to force validation: if you want to harvest these metadata anyway, simply turn it off.

| Result vs harvesting type | GeoNetwork | WebDAV | CSW | OAI-PMH | OGC Service | ISRIC |
|---|---|---|---|---|---|---|
| Total | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Added | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Removed | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Updated | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Unchanged | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Unknown schema | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Unretrievable | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Bad Format | | ✓ | | ✓ | | |
| Does Not Validate | | ✓ | | ✓ | | |
| Status not ok | | | | | | ✓ |
| Thumbnails / Thumbnails failed | | | | | ✓ | |
| Metadata URL attribute used | | | | | ✓ | |

*Result information supported by harvesting types*

### 3.5.7 Adding new nodes

The Add button in the main page allows you to add new harvesting nodes. It will open the form shown in *admin_harvesting_add*. When creating a new node, you have to choose the harvesting protocol supported by the remote server. The supported protocols are:

1. ***GeoNetwork 2.1 remote node*** This is the standard and most powerful harvesting protocol used in GeoNetwork. It is able to log in into the remote node, to perform a standard search using the common query fields and to import all matching metadata. Furthermore, the protocol will try to keep both remote privileges and categories of the harvested metadata if they exist locally. Please notice that since GeoNetwork 2.1 the harvesting protocol has been improved. This means that it is not possible to use this protocol to harvest from version 2.0 or below.

2. ***WebDAV server*** This harvesting type uses the webDAV (Distributed Authoring and Versioning) protocol to harvest metadata from a DAV server. It can be useful to users that want to publish their metadata through a web server that offers a DAV interface. The protocol allows to retrieve the contents of a web page (a list of files) with their change date.

3. ***Catalogue Services for the Web 2.0*** The Open Geospatial Consortium Catalogue Services for the Web and it is a search interface for catalogues developed by the Open Geospatial Consortium. GeoNetwork implements version 2.0 of this protocol.
4. ***GeoNetwork v2.0 remote node*** GeoNetwork 2.1 introduced a new powerful harvesting engine which is not compatible with GeoNetwork version 2.0 based catalogues. Old 2.0 servers can still harvest from 2.1 servers but harvesting metadata from a v2.0 server requires this harvesting type. This harvesting type is deprecated.
5. ***Z3950 Remote search*** Not implemented. This is a placeholder.
6. ***OAI Protocol for Metadata Harvesting 2.0*** This is a good harvesting protocol that is widely used among libraries. GeoNetwork implements version 2.0 of the protocol.
7. ***ArcSDE*** This is a harvesting protocol for metadata stored in an ArcSDE installation.
8. ***ISRIC*** This is a harvesting protocol for metadata stored according to the struture defined by this XSD.

The drop down list shows all available protocols. Pressing the Add button you will reach an edit page whose content depends on the chosen protocol. The Back button will go back to the main page.

Figure 3.22: *Adding a new harvesting node*

### Adding a GeoNetwork node

This type of harvesting allows you to connect to a GeoNetwork node, perform a simple search as in the main page and retrieve all matched metadata. The search is useful because it allows you to focus only on metadata of interest. Once you add a node of this type, you will get a page like the one shown below. The meaning of the options is the following:

- **Site** - Here you put information about the GeoNetwork's node you want to harvest from (host, port and servlet). If you want to search protected metadata you have to specify an account. The name parameter is just a short description that will be shown in the main page beside each node.
- **Search criteria** - In this section you can specify search parameters: they are the same present in the GeoNetwork homepage. Before doing that, it is important to remember that the GeoNetwork's harvesting can be hierarchical so a remote node can contain both its metadata and metadata harvested from other nodes and sources. At the beginning, the Source drop down is empty and you have to use the **Retrieve sources** button to fill it. The purpose of this button is to query GeoNetwork about all sources which it is currently harvesting from. Once you get the drop down filled, you can choose a source name to constrain the search to that source only. Leaving the drop down blank, the search will spread over all metadata (harvested and not). You can add several search criteria for each site through the **Add** button: several searches will be performed and results merged. Each search box can be removed pressing the small button on the left of the site's name. If no search criteria is added, a global unconstrained search will be performed.
- **Options** - This is just a container for general options.

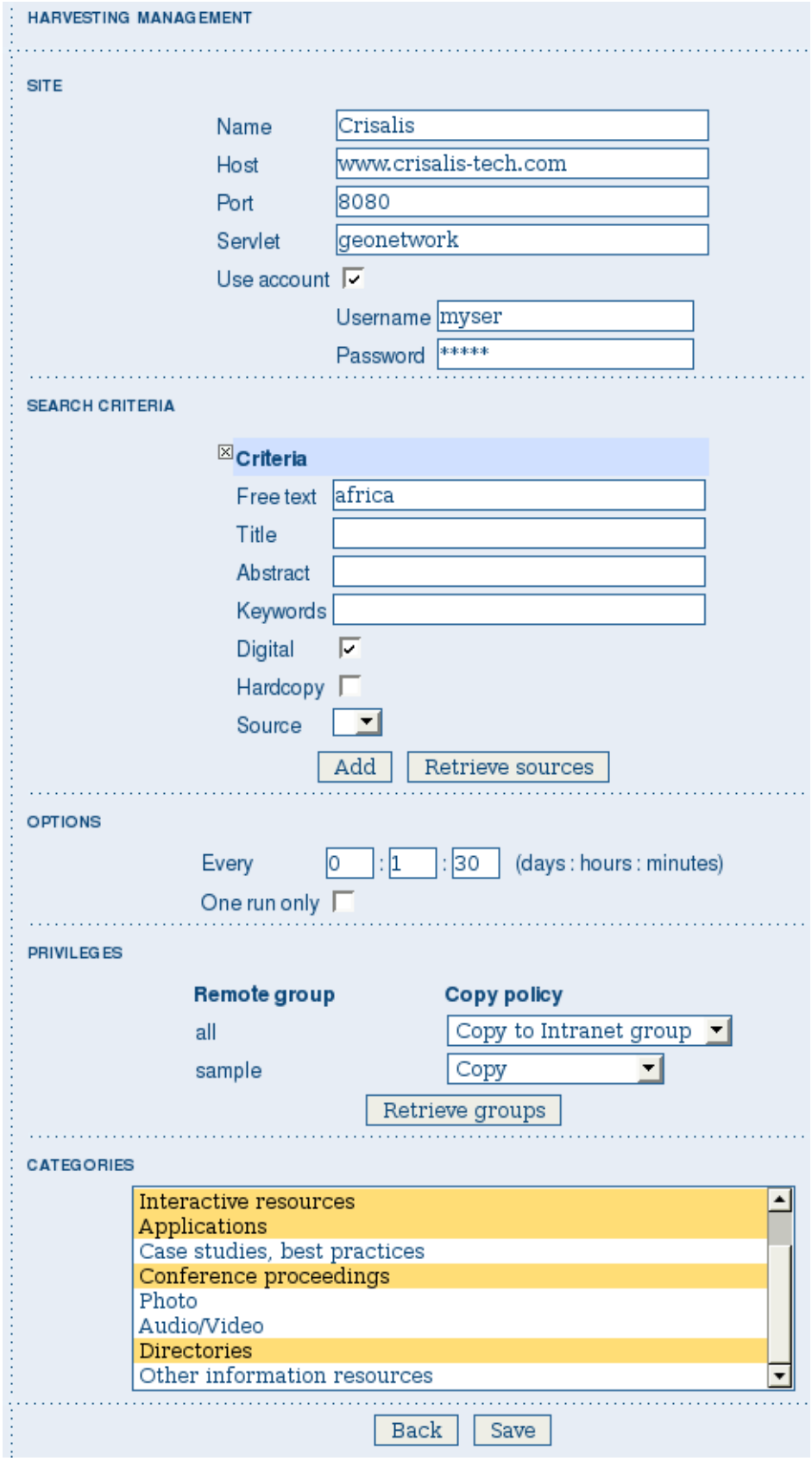



Figure 3.23: *Adding a GeoNetwork node*

  - *Every* - This is the harvesting period. The smallest value is 1 minute while the greatest value is 100 days.
  - *One run only* - If this option is checked, the harvesting will do only one run after which it will become inactive.

- **Privileges** - Here you decide how to map remote group's privileges. You can assign a copy policy to each group. The Intranet group is not considered because it does not make sense to copy its privileges.
  - The **All** group has different policies from all the others:
    1. Copy: Privileges are copied.
    2. Copy to Intranet: Privileges are copied but to the Intranet group. This way public metadata can be made protected.
    3. Don't copy: Privileges are not copied and harvested metadata will not be publicly visible.
  - For all other groups the policies are these:
    1. Copy: Privileges are copied only if there is a local group with the same (not localised) name as the remote group.
    2. Create and copy: Privileges are copied. If there is no local group with the same name as the remote group then it is created.
    3. Don't copy: Privileges are not copied.

### Adding a WebDAV node

In this type of harvesting, metadata are retrieved from a remote web page. The available options are shown below and have the following meaning:

- **Site** - This contains the connection information.
  - *Name* - This is a short description of the node. It will be shown in the harvesting main page.
  - *URL* - The remote URL from which metadata will be harvested. Each file found that ends with .xml will indicate a metadata and will be retrieved, converted into XML and imported.
  - *Icon* - Just an icon to assign to harvested metadata. The icon will be used when showing search results.
  - *Use account* - Account credentials for a basic HTTP authentication towards the remote URL.
- **Options** - General harvesting options.
  - *Every* - This is the harvesting period. The smallest value is 1 minute while the greatest value is 100 days. One run only If this option is checked, the harvesting will do only one run after which it will become inactive.
  - *Validate* - If checked, the metadata will be validate during import. If the validation does not pass, the metadata will be skipped.
  - *Recurse* - When the harvesting engine will find folders, it will recursively descend into them.
- **Privileges** - Here it is possible to assign privileges to imported metadata.

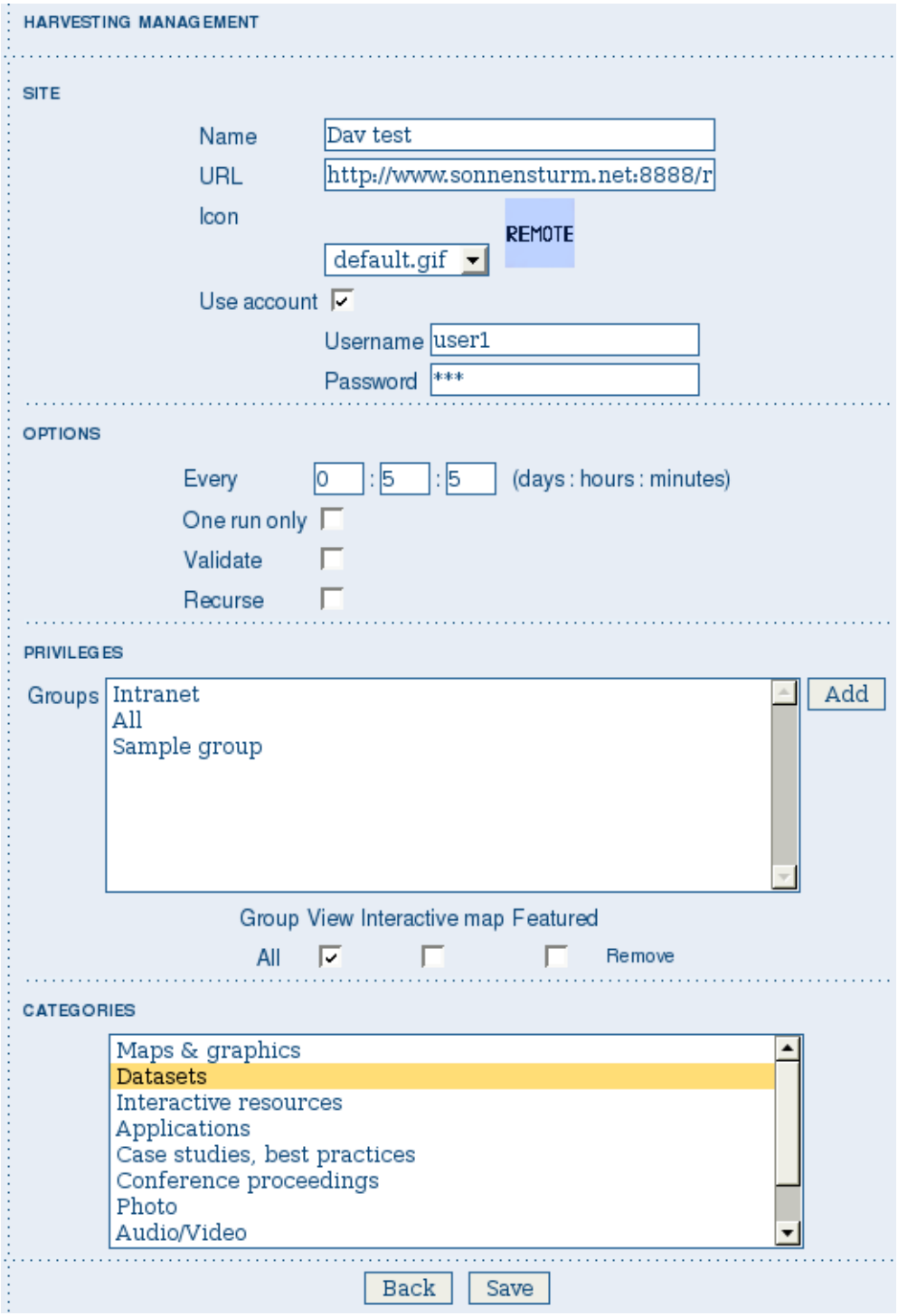



Figure 3.24: *Adding a WebDAV node*

  - *Groups* - Groups area lists all available groups in GeoNetwork. Once one (or more) group has been selected, it can be added through the **Add** button (each group can be added only once). For each added group, a row of privileges is created at the bottom of the list to allow privilege selection.
  - *Remove* - To remove a row simply press the associated Remove button on its right.
- **Categories** - Here you can assign local categories to harvested metadata.

### Adding a CSW node

This type of harvesting is capable of connecting to a remote CSW server and retrieving all matching metadata. Please, note that in order to be harvested metadata must have one of the schema format handled by GeoNetwork.

The figure above shows the options available:

- **Site** - Here you have to specify the connection parameters which are similar to the web DAV harvesting. In this case the URL points to the capabilities document of the CSW server. This document is used to discover the location of the services to call to query and retrieve metadata.
- **Search criteria** - Using the Add button, you can add several search criteria. You can query only the fields recognised by the CSW protocol.
- **Options** - General harvesting options:
  - *Every* - This is the harvesting period. The smallest value is 1 minute while the greatest value is 100 days.
  - *One run only* - If this option is checked, the harvesting will do only one run after which it will become inactive.
- **Privileges** - Please, see WebDAV harvesting.
- **Categories** - Please, see WebDAV harvesting.

### Adding an OAI-PMH node

An OAI-PMH server implements a harvesting protocol that GeoNetwork, acting as a client, can use to harvest metadata. If you are requesting the oai_dc output format, GeoNetwork will convert it into its Dublin Core format. Other formats can be harvested only if GeoNetwork supports them and is able to autodetect the schema from the metadata.

Configuration options:

- **Site** - All options are the same as WebDAV harvesting. The only difference is that the URL parameter here points to an OAI-PMH server. This is the entry point that GeoNetwork will use to issue all PMH commands.
- **Search criteria** - This part allows you to restrict the harvesting to specific metadata subsets. You can specify several searches: GeoNetwork will execute them sequentially and results will be merged to avoid the harvesting of the same metadata. Several searches allow you to specify different search criteria. In each search, you can specify the following parameters:
  - *From* - You can provide a start date here. All metadata whose last change date is equal to or greater than this date will be harvested. You cannot simply edit this field but you have to

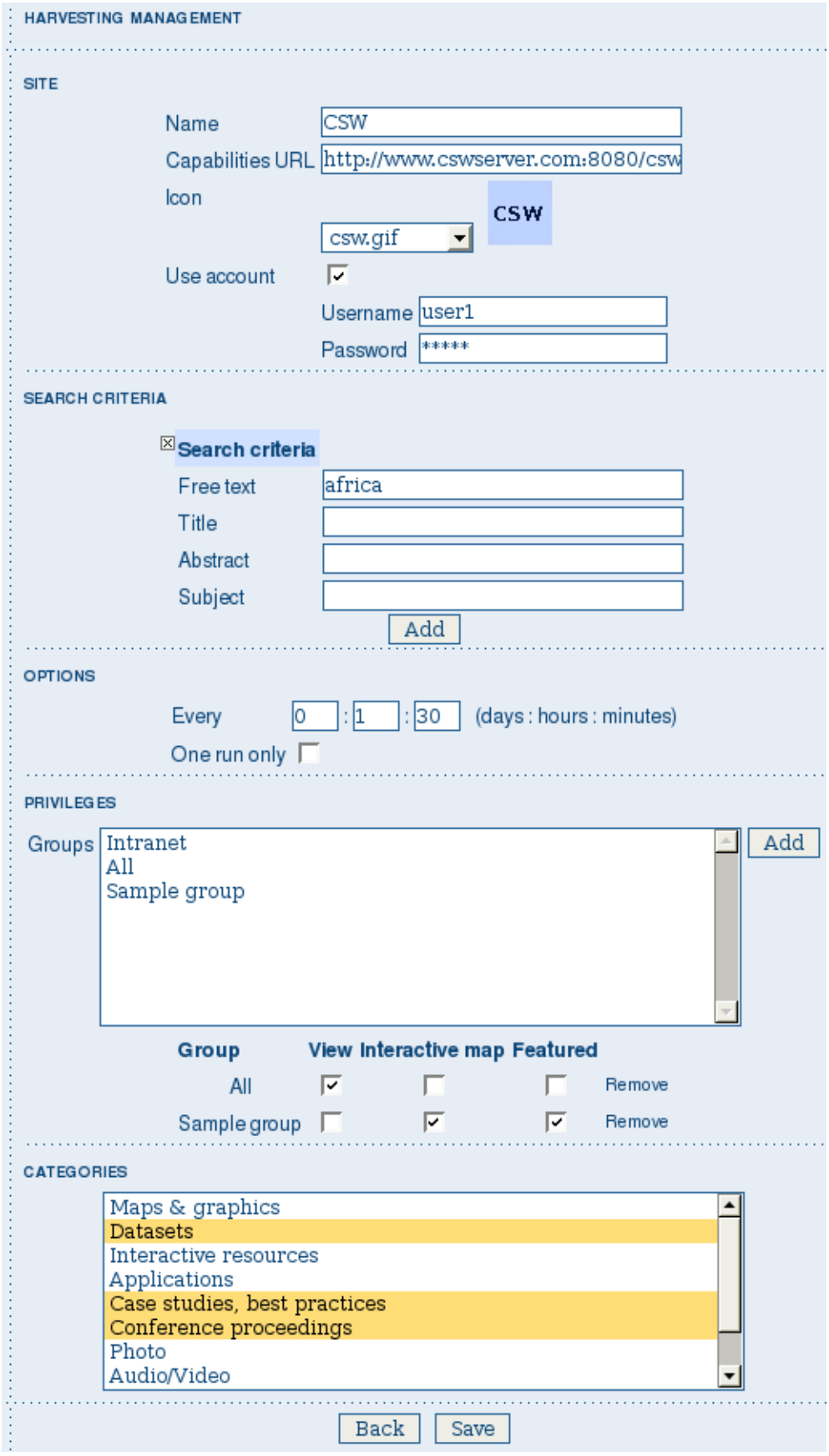



Figure 3.25: *Adding a Catalogue Services for the Web harvesting node*

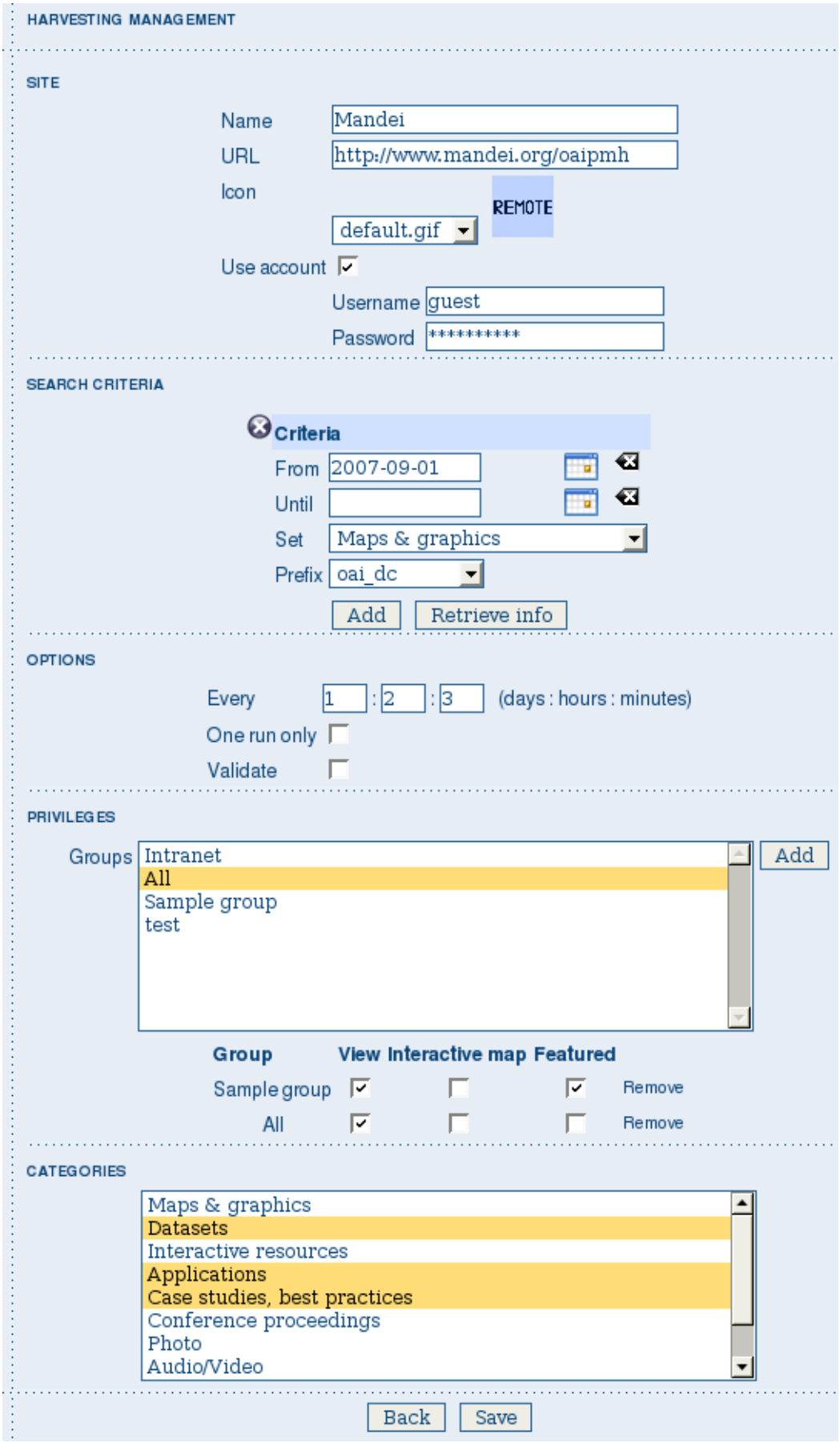



Figure 3.26: *Adding an OAI-PMH harvesting node*

use the icon to popup a calendar and choose the date. This field is optional so if you don't provide it the start date constraint is dropped. Use the icon to clear the field.

  - *Until* - Works exactly as the from parameter but adds an end constraint to the last change date. The until date is included in the date range, the check is: less than or equal to.
  - *Set* - An OAI-PMH server classifies its metadata into hierarchical sets. You can request to return metadata that belong to only one set (and its subsets). This narrows the search result. Initially the drop down shows only a blank option that indicate *no set*. After specifying the connection URL, you can press the **Retrieve Info** button, whose purpose is to connect to the remote node, retrieve all supported sets and prefixes and fill the search drop downs. After you have pressed this button, you can select a remote set from the drop down.
  - *Prefix* - Here prefix means metadata format. The oai_dc prefix is mandatory for any OAI-PMH compliant server, so this entry is always present into the prefix drop down. To have this drop down filled with all prefixes supported by the remote server, you have to enter a valid URL and press the Retrieve Info button.
  - You can use the Add button to add one more search to the list. A search can be removed clicking the icon on its left.

- **Options** - Most options are equivalent to WebDAV harvesting.
  - *Validate* - The validate option, when checked, will validate each harvested metadata against GeoNetwork's schemas. Only valid metadata will be harvested. Invalid one will be skipped.
- **Privileges** - Please, see WebDAV harvesting.
- **Categories** - Please, see WebDAV harvesting.

Please note that when you edit a previously created node, both the *set* and *prefix* drop down lists will be empty. They will contain only the previously selected entries, plus the default ones if they were not selected. Furthermore, the set name will not be localised but the internal code string will be displayed. You have to press the retrieve info button again to connect to the remote server and retrieve the localised name and all set and prefix information.

### Adding an OGC Service (ie. WMS, WFS, WCS)

An OGC service implements a GetCapabilities operation that GeoNetwork, acting as a client, can use to produce metadata. The GetCapability document provides information about the service and the layers/feature types/coverages served. GeoNetwork will convert it into ISO19139/119 format.

Configuration options:

- **Site**
  - *Name* - The name of the catalogue and will be one of the search criteria.
  - *Type* - The type of OGC service indicates if the harvester has to query for a specific kind of service. Supported type are WMS (1.0.0 and 1.1.1), WFS (1.0.0 and 1.1.0, WCS (1.0.0) and WPS (0.4.0 and 1.0.0).
  - *Service URL* - The service URL is the URL of the service to contact (without parameters like "REQUEST=GetCapabilities", "VERSION=", ...). It has to be a valid URL like http://your.preferred.ogcservice/type_wms.
  - *Metadata language* - Required field that will define the language of the metadata. It should be the language used by the web service administrator.

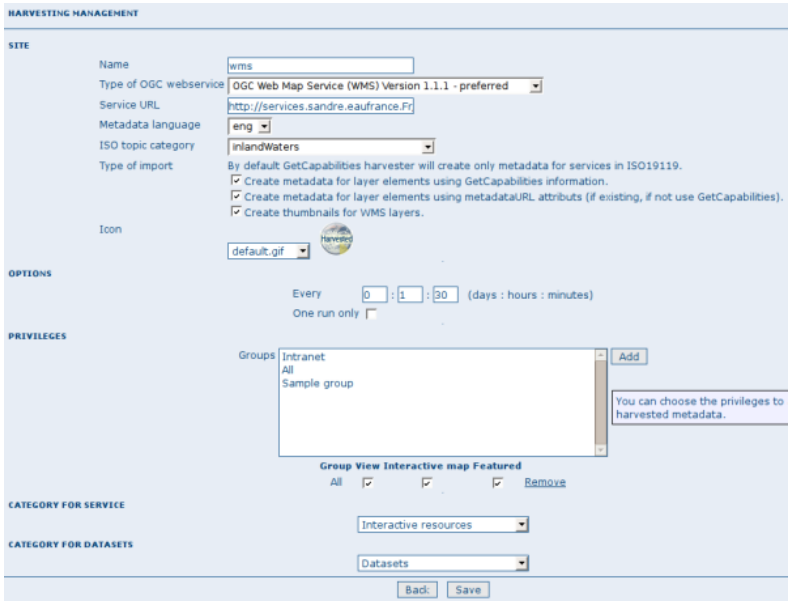



Figure 3.27: *Adding an OGC service harvesting node*

  - *ISO topic category* - Used to populate the metadata. It is recommended to choose on as the topic is mandatory for the ISO standard if the hierarchical level is "datasets".
  - *Type of import* - Defines if the harvester should only produce one service metadata record or if it should loop over datasets served by the service and produce also metadata for each datasets. For each dataset the second checkbox allow to generate metadata for the dataset using an XML document referenced in the MetadataUrl attribute of the dataset in the GetCapability document. If this document is loaded but it is not valid (ie. unknown schema, bad XML format), the GetCapability document is used.

  For WMS, thumbnails could be created during harvesting. - *Icon* - The default icon displayed as attribution logo for metadata created by this harvester.

- **Options** - Please, see WebDAV harvesting.
- **Privileges** - Please, see WebDAV harvesting.
- **Category for service** - Metadata for the harvested service is linked to the category selected for the service (usually "interactive resources").
- **Category for datasets** - For each dataset, the "category for datasets" is linked to each metadata for datasets.

### Adding an ArcSDE server

The ArcSDE harvester allows harvesting metadata from an ArcSDE installation. ArcSDE java API libraries are required to be installed by the user in GeoNetwork (folder `INSTALL_DIR/web/geonetwork/WEB-INF/lib`), as these are proprietary libraries not distributed with GeoNetwork:

- jpe_sdk.jar
- jsde_sdk.jar

**Note:** dummy-api-XXX.jar must be removed from `INSTALL_DIR/web/geonetwork/WEB-INF/lib`

The harvester identifies the ESRI metadata format: ESRI ISO, ESRI FGDC to apply the required xslts to transform metadata to ISO19139

Configuration options:

- **Site**
  - *Name* - This is a short description of the node. It will be shown in the harvesting main page.
  - *Server* - ArcSde server IP or name
  - *Port* - ArcSde service port (tipically 5151)
  - *Username* - Username to connect to ArcSDE server
  - *Password* - Password of the ArcSDE user
  - *Database name* - ArcSDE instance name (tipically esri_sde)
- **Options** - Please, see WebDAV harvesting.
- **Privileges** - Please, see WebDAV harvesting.
- **Category for service** - Metadata for the harvested service is linked to the category selected for the service (usually "interactive resources").
- **Category for datasets** - For each dataset, the "category for datasets" is linked to each metadata for datasets.

### Adding an ISRIC node

This type of harvesting is capable of connecting to a remote server that provides ISRIC metadata according to the format defined by this XSD, retrieving all matching metadata and transforming it to ISO19139.

The figure above shows the options available:

- **Site** - Here you have to specify the connection parameters which are similar to the web DAV harvesting. In this case the URL points to the service to call to query and retrieve ISRIC metadata. The format for the service URL is like:

  http://SERVICE_URL?QUERY_PARAM_NAME= (for example, http://library.wur.nl/WebQuery/isric/xml?isric/@isn=)

- **Options** - General harvesting options:
  - *Every* - This is the harvesting period. The smallest value is 1 minute while the greatest value is 100 days.
  - *One run only* - If this option is checked, the harvesting will do only one run after which it will become inactive.
  - *Validate* - If this option is checked, the harvested metadata transformed to ISO19139 will be validated. If the validation does not pass, the metadata will be skipped.

  ISRIC specific harvesting options:

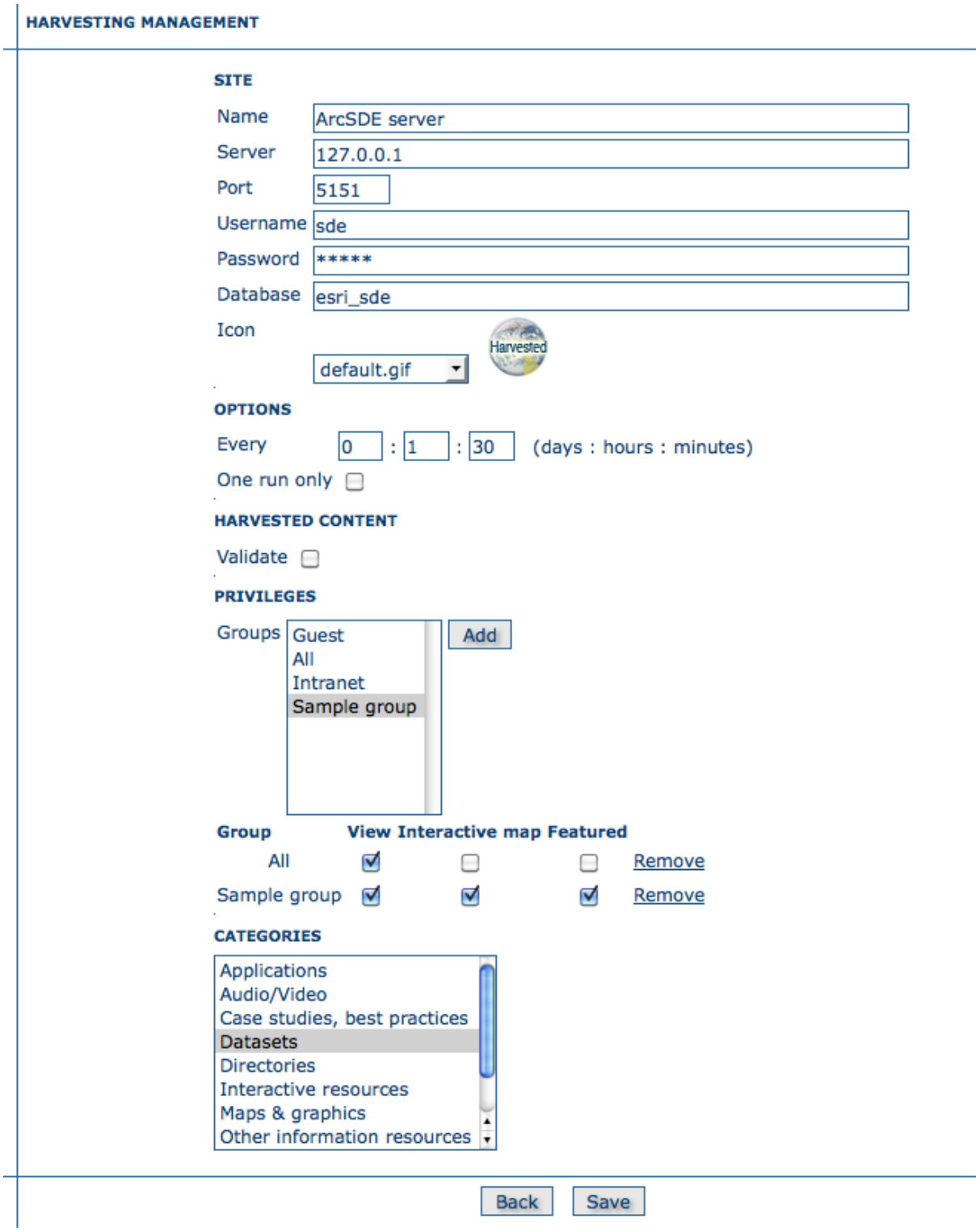



Figure 3.28: *Adding an ArcSDE harvesting node*

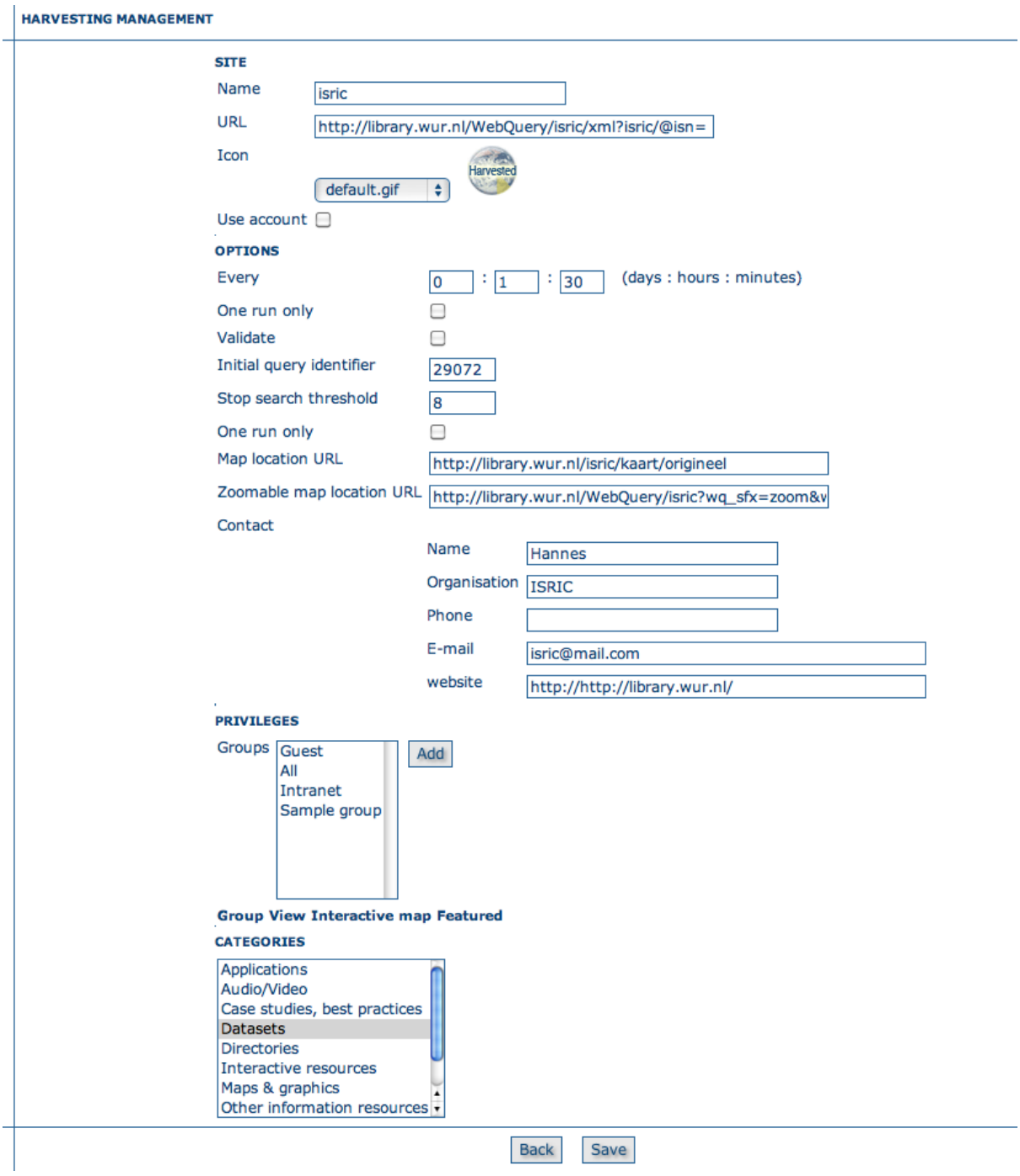



Figure 3.29: *Adding an ISRIC harvesting node*

  - *Start query identifier* - Initial identifier to start the harvesting. This option is required as the ISRIC service doesn't provide a list operation to retrieve all records, requiring to retrieve the records providing the identifier of metadata.
  - *Stop search threshold* - The number of not existing metadata records after the last successful metadata retrieved, used to stop the harvesting search. Enables to stop the harvester if no metadata are retrieved after the last success identifier + stop threshold. This is the only way to identify no more records, as identifiers are also no sequential.
  - *Map location URL* - The base URL for the map image resource referenced in ISRIC 'map' field.
  - *Zoomanble map location URL* - The base URL for the map online resource referenced in ISRIC 'map' field.
- **Contact** - Contact information to associate to harvested metadata:
  - *Contact name* - Contact person name
  - *Contact organisation* - Contact organisation
  - *Contact phone* - Contact phone
  - *Contact email* - Contact email
  - *Contact web* - Contact website
- **Privileges** - Please, see WebDAV harvesting.
- **Categories** - Please, see WebDAV harvesting.

## 3.6 Metadata ownership

### 3.6.1 Introduction

Starting from release 2.1.0, GeoNetwork has a new metadata access policy. The old edit and admin privileges have been removed and the concept of reviewer has been introduced. The purpose of this new profile is to control when a metadata can be published outside or not. In previous releases, all users belonging to a group with edit privileges could edit the same metadata. Now, a metadata is only visible to its creator, to a reviewer which has access to the group owner and to an administrator.

### 3.6.2 Access policy

A public metadata is a metadata that has the view privilege for the group named all.

#### Visualisation

An administrator can view any metadata.

A reviewer can view a metadata if:

1. The metadata owner is member of one of the groups assigned to the reviewer.
2. She/he is the metadata owner.

A user administrator or an editor can view:

1. All metadata that has the view privilege selected for one of the groups she/he is member of.
2. All metadata created by her/him.

A registered user can view:

1. All metadata that has the view privilege selected for one of the groups she/he is member of.

Public metadata can be viewed by any user (logged in or not).

#### Editing

An administrator can edit any metadata.

A reviewer can edit a metadata if:

1. The metadata owner is member of one of the groups assigned to the reviewer.
2. She/he is the metadata owner.

A User Administrator or an Editor can only edit metadata she/he created.

### 3.6.3 Privileges

The Privileges administration page is accessible only by:

1. All Administrators
2. All Reviewers that are member of one of the groups assigned to the metadata owner.
3. The Owner of the metadata

Privileges for the All and Intranet groups can only be edited by Administrators and Reviewers.

### 3.6.4 Transfer Ownership

When metadata ownership needs to be transferred from one user to another for all or specific metadata records, the Transfer Ownership option is available. It is located in the Administration page and once selected, leads to the following page.

Initially, the page shows only a dropdown for a Source editor (the current metadata owner). The dropdown is filled with all GeoNetwork Users that have the Editor role and own some metadata. Selecting an Editor will select all metadata that is managed by that Editor. An empty dropdown means that there are no Editors with metadata associated and hence no transfer is possible.

Note The drop down will be filled with all Editors visible to you. If you are not an Administrator, you will view only a subset of all Editors.

Once a Source Editor has been selected, a set of rows is displayed. Each row refers to the group of the Editor for which there are privileges. The meaning of each column is the following:

1. *Source group*: This is a group that has privileges in the metadata that belong to the source editor. Put in another way, if one of the editor's metadata has privileges for one group, that group is listed here.
2. *Target group*: This is the destination group of the transferring process. All privileges relative to the source group are transferred to the target group. The target group drop down is filled with all groups visible to the logged user (typically an administrator or a user administrator). By default,

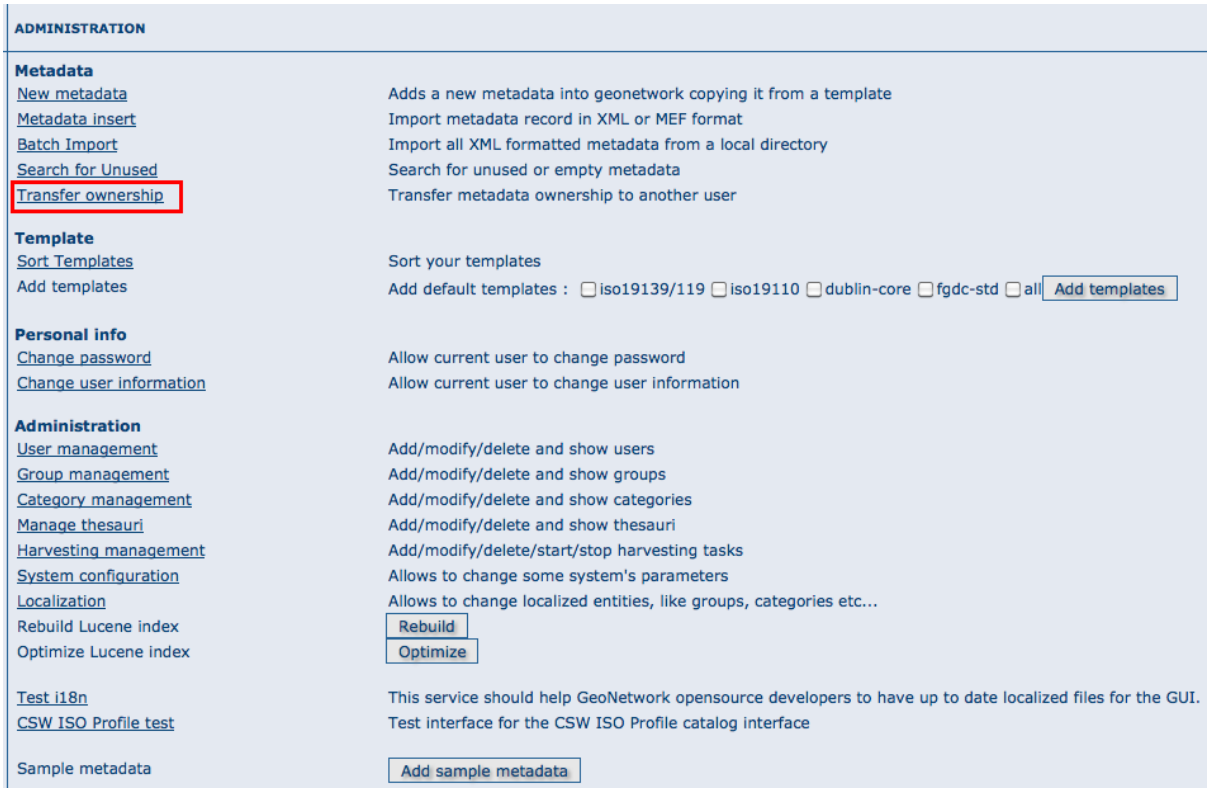



Figure 3.30: *How to open the Transfer Ownership page*

Figure 3.31: *The Transfer Ownership page*

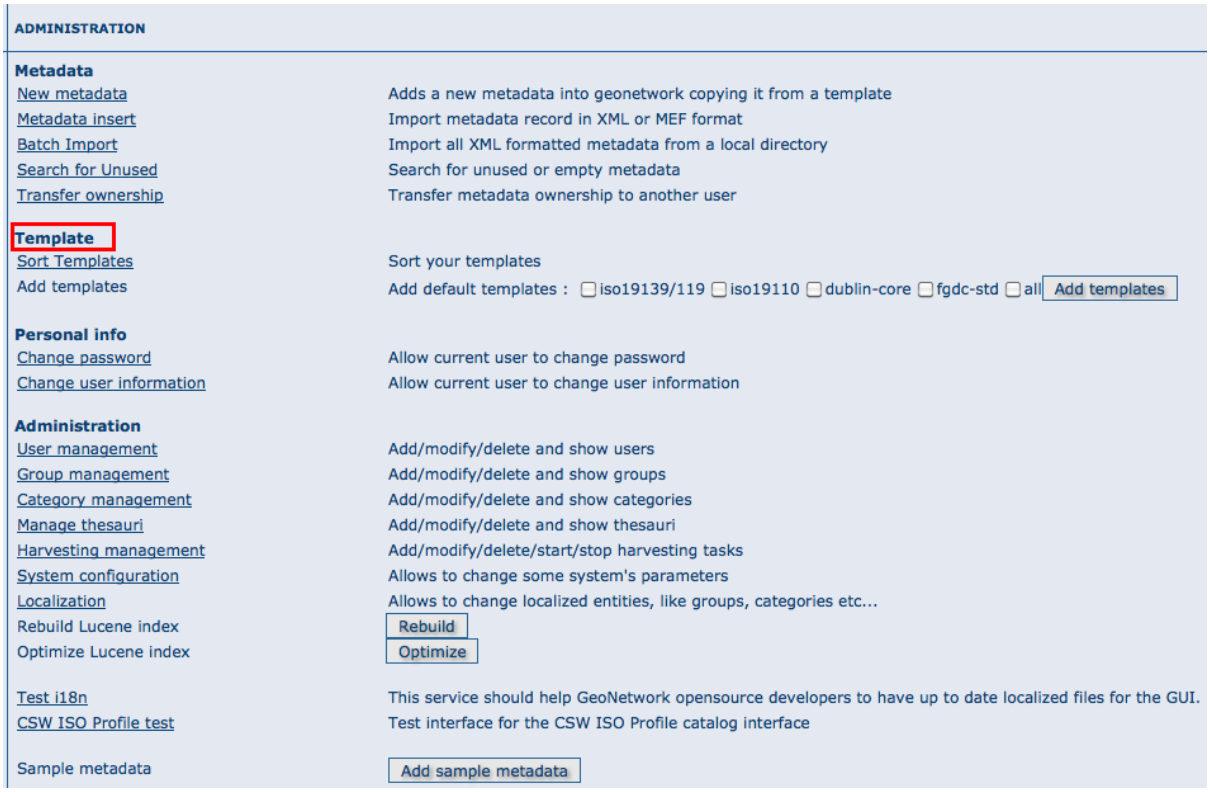
the Source group is selected in the target dropdown. Privileges to groups All and Intranet are not transferable.

3. *Target editor*: Once a Target group is selected, this drop down is filled with all editors that belong to that Target group.
4. *Operation*: Currently only the Transfer operation is possible.

By selecting the Transfer operation, if the Source group is different than the Target group, the system performs the Transfer of Ownership, shows a brief summary and removes the current row because now there are no privileges to transfer anymore.

## 3.7 Templates

The templates options allows to manage the metadata templates in the catalog. In order to use these facilities, you have to be logged in as an administrator. After the login step, go to the administration page.



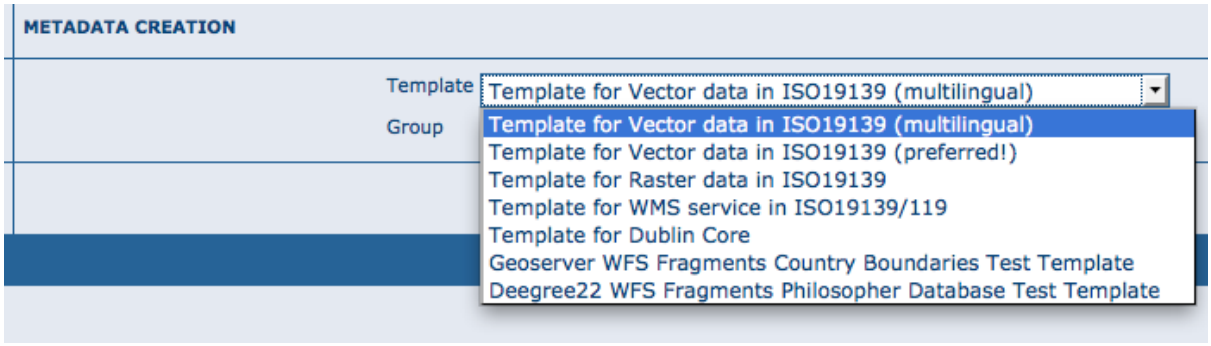

### 3.7.1 Sort templates

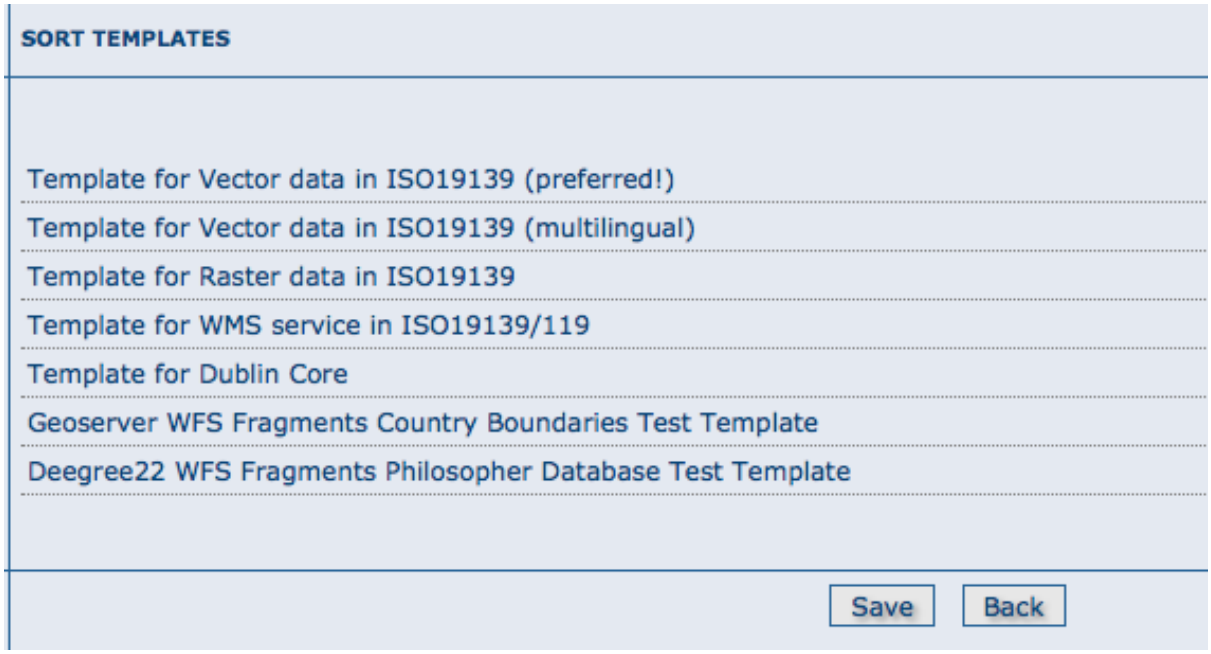
This option allows to set the order of the templates avalaible when creating a new metadata.

In the administration panel, select Sort Templates option:

The list of avalaible templates is shown with the current display order. To change the position of a template click on it's name and drag it to move it to the new position.

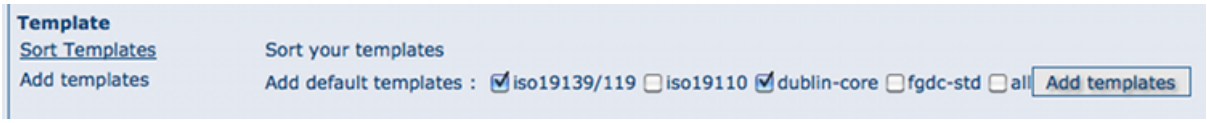
Once the order of templates is configured, click on Save button to save the changes. To cancel the changes and return to the administration form click on Back button.


METADATA CREATION
Template
Group
Template for Vector data in ISO19139 (multilingual)
Template for Vector data in ISO19139 (multilingual)
Template for Vector data in ISO19139 (preferred!)
Template for Raster data in ISO19139
Template for WMS service in ISO19139/119
Template for Dublin Core
Geoserver WFS Fragments Country Boundaries Test Template
Deegree22 WFS Fragments Philosopher Database Test Template


SORT TEMPLATES
Template for Vector data in ISO19139 (preferred!)
Template for Vector data in ISO19139 (multilingual)
Template for Raster data in ISO19139
Template for WMS service in ISO19139/119
Template for Dublin Core
Geoserver WFS Fragments Country Boundaries Test Template
Deegree22 WFS Fragments Philosopher Database Test Template
Save
Back

### 3.7.2 Add templates

This option allows the user to select the metadata templates to add in the catalog to create new metadata records.




Mark the metadata templates to import and click Add templates button to import them in the catalog and make them are avaliable when creating new metadata records.

## 3.8 Thesaurus

### 3.8.1 Introduction

Thesaurus support in GeoNetwork allows:

- *Metadata editing*: controlled vocabulary on the metadata editing interface for ISO and Dublin Core
- *Administration interface* allows import/export/creation/browse thesaurus
- *Search interface*: a list of keyword is proposed for the keyword criteria

On a node, thesaurus types could be defined as:

- *External*: When a thesaurus is imported, it is flagged to ”external” which means that users are not allowed to edit the thesaurus. This thesaurus is managed by an external organisation.
- *Local*: When a thesaurus is created, it is flagged to ”local” which means that users are allowed to edit the thesaurus.

### 3.8.2 Thesaurus / SKOS format

The Simple Knowledge Organisation Systems (SKOS) http://www.w3.org/2004/02/skos/ is an area of work developing specifications and standards to support the use of knowledge organisation systems (KOS) such as thesauri, classification schemes. This format is used by GeoNetwork to store thesaurus information.

A concept is defined by an identifier, a preferred label, a definition and links with other concepts. Labels and definitions could be stored in multiple languages (using the xml:lang attributes). Three type of links between concepts have been defined in the SKOS format:

- related terms
- broader terms
- narrower terms

For example, a concept ”ABLETTE” could be defined as follow with a label in French and English, linked to broader concept:

```
<skos:Concept rdf:about="http://www.oieau.org/concept#c4fc54576dc00227b82a709287ac3681">
    <skos:prefLabel xml:lang="fr">ABLETTE</skos:prefLabel>
    <skos:prefLabel xml:lang="en">BLEAK</skos:prefLabel>
    <skos:broader rdf:resource="http://www.oieau.org/concept#9f25ece36d04776e09492c66627
</skos:Concept>
```

GeoNetwork support multilingual thesaurus (e.g. Agrovoc). Search and edition are made based on current user interface language (i.e. if the interface is in English, when editing metadata, GeoNetwork will only search for concept in English).

### 3.8.3 Thesaurus administration

To reach the thesaurus administration page you have to be logged in as an administrator. From the administration page, click the link "Manage thesauri". The page shows a list of thesaurus that have been created or imported. The upper part of the page allows user to edit/add/modify/consult thesaurus. The lower part allows upload of thesaurus in SKOS format.

#### Creation of a new thesaurus

To create a new thesaurus, click the "+" sign in the category you want your thesaurus to be in. Once created, the thesaurus could be updated through the edit interface. The meaning of each column is as follows:

- **Type** - The type allows to classify thesaurus according to its type. First, is defined the type of the thesaurus following ISO category list, then the type indicates if the thesaurus is a local one or an external one.
- **Name** - This is the thesaurus's name provided by the administrator on creation or filename on upload. When creating a thesaurus, the name of the thesaurus will be the filename of the thesaurus.

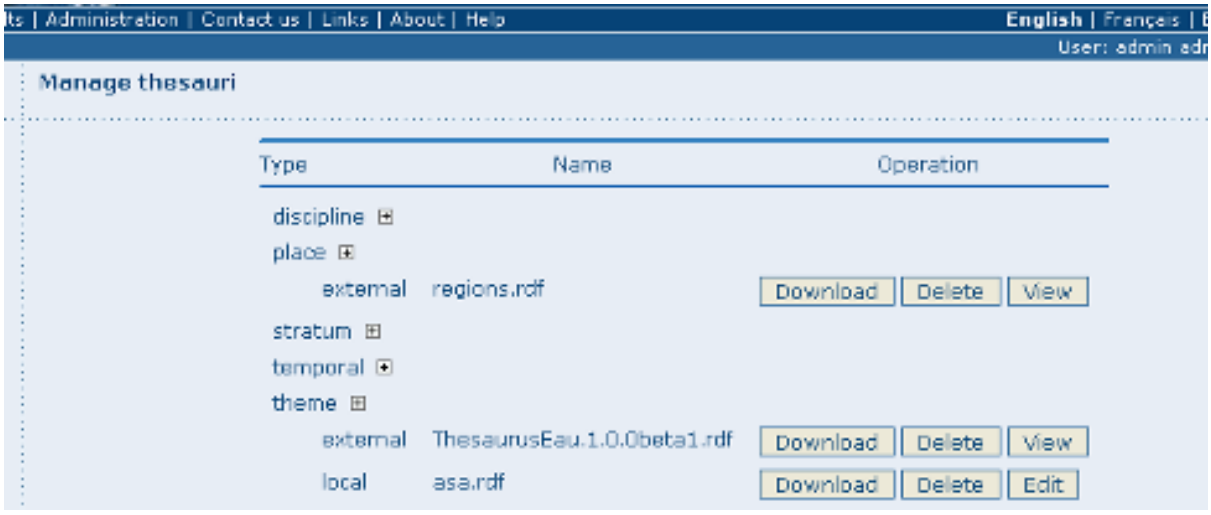



Figure 3.32: *Administration interface for thesaurus*

For each thesaurus the following buttons are available:

- **Download** - Link to the RFD file.
- **Delete** - Remove thesaurus from the current node.

- **View** - If type is external, the view button allows to search and view concepts.
- **Edit** - If type is local, the edit button allows to search, add, remove and view concepts.

#### Import existing thesaurus

GeoNetwork allows thesaurus import in SKOS format. Once uploaded, an external thesaurus could not be updated. Select the category, browse for the thesaurus file and click upload. The file is located in /web/xml/codelist/external/thesauri/category/.

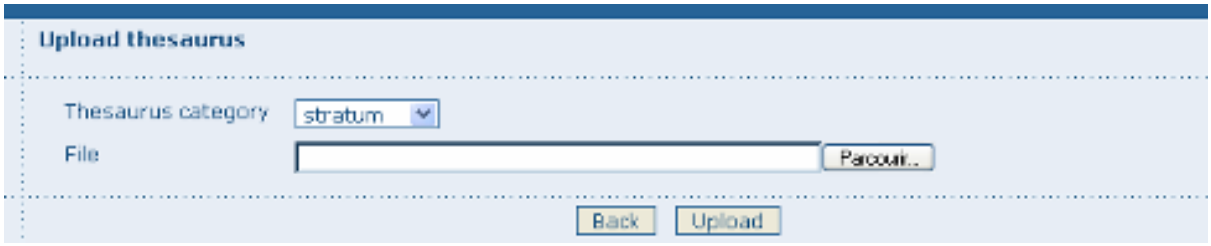



Figure 3.33: *Upload interface for thesaurus*

At the bottom of the page there are the following buttons:

1. *Back*: Go back to the main administration page.
2. *Upload*: Upload the selected RFD file to the node. Then it will list all thesaurus available on the node.

### 3.8.4 Editing/browsing thesaurus: add/remove/browse keywords

From the thesaurus administration interface, click on the edit button for a local thesaurus or the view button for an external thesaurus. This interface allows:

- keywords search
- add/remove keywords for local thesaurus.

Use the textbox and the type of search in order to search for keywords.

### 3.8.5 Metadata editing: adding keywords

When editing metadata in ISO, it allows editors to: - do one or more searches in all thesaurus registered in the catalogue. - select one or more keywords added to the selected items list (using arrows or drag & drop) on the right. - add the selected keywords directly into metadata, grouping keywords by thesaurus.

The search interface allows editors to choose the maximum number of keywords to returns, and the thesaurus to search into (default is all).

### 3.8.6 Search criteria: keywords

In the advanced search interface, search for keyword is available.

By default, the keyword field will proposed all keywords used in the metadata. These keywords are indexed by Lucene on creation/update of metadata. The number of metadata linked to all keywords

Figure 3.34: *Browse interface for thesaurus*

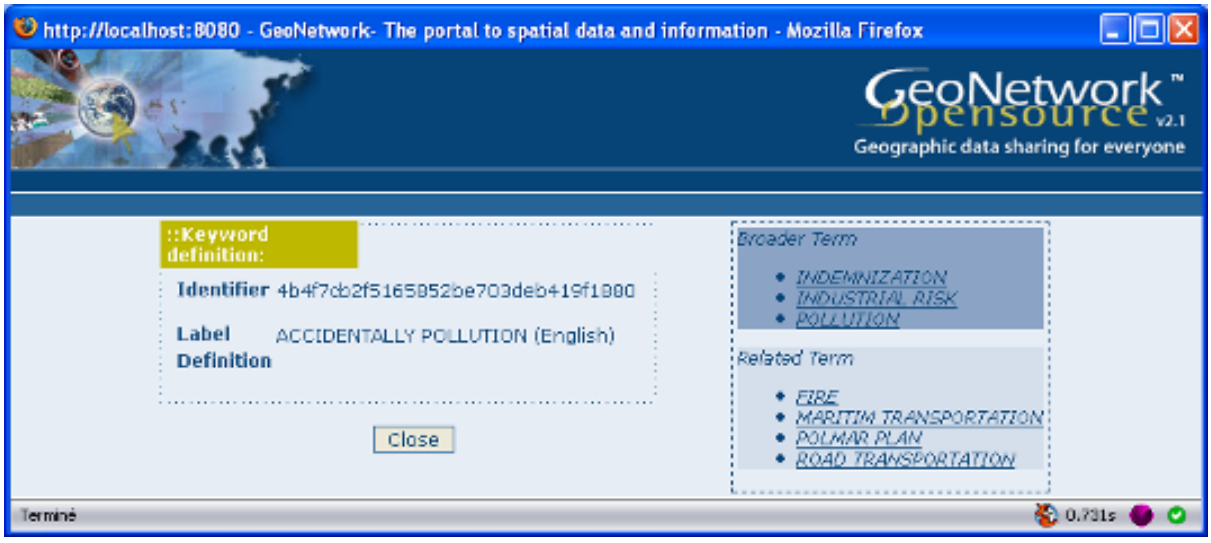



Figure 3.35: *Keyword description*

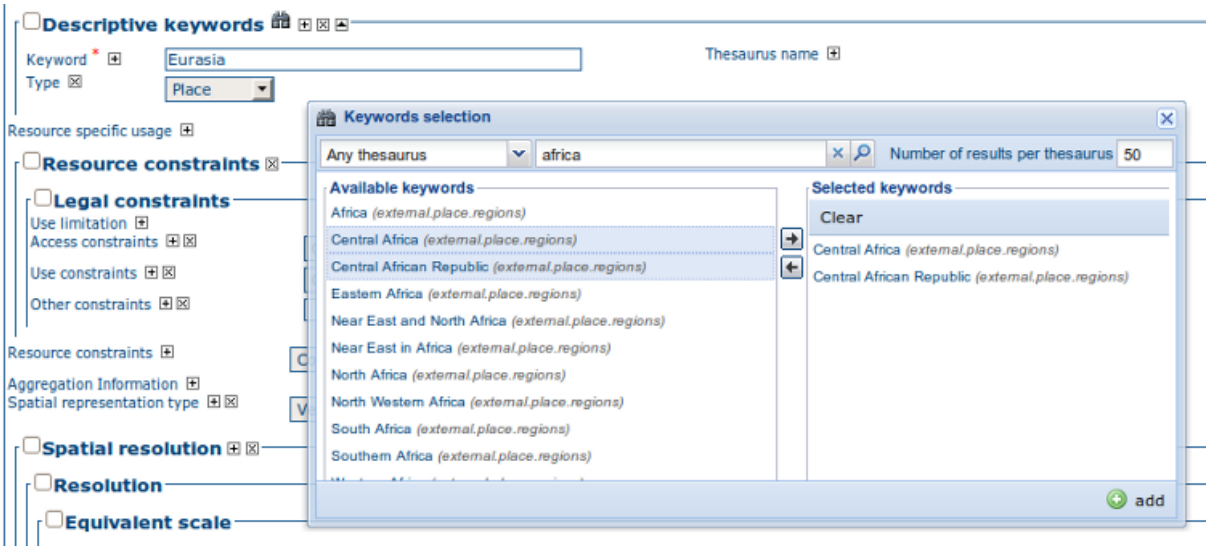



Figure 3.36: *Keyword selection interface (editing mode)*

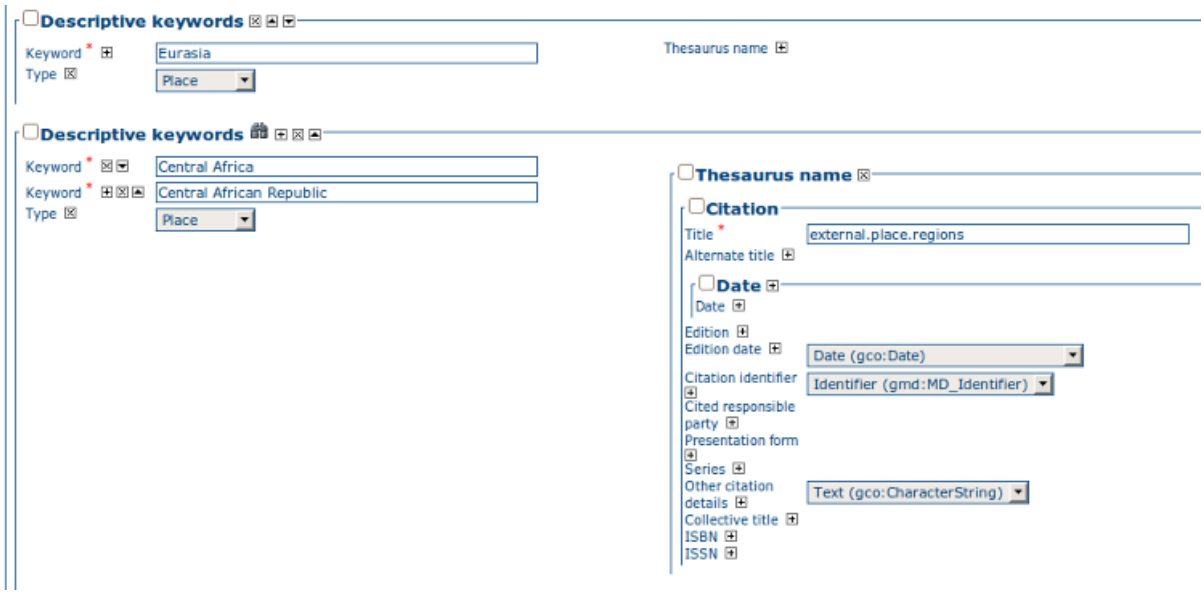



Figure 3.37: *Keyword selection (view mode)*

available in the index are display. User could type in the keyword field or click the icon to get the list of keywords available.

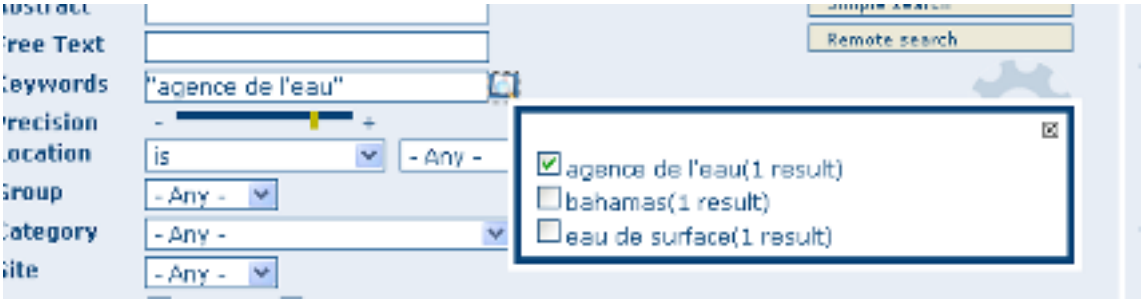



Figure 3.38: *Thesaurus search interface*

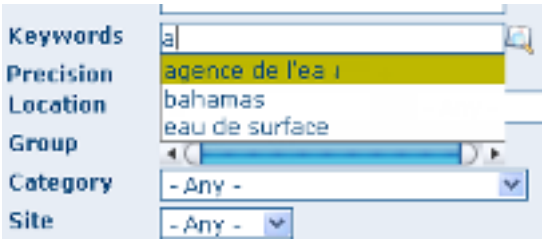



Figure 3.39: *Auto-complete function in thesaurus search interface*

By configuring the *config-gui.xml* file in the WEB-INF directory, search for keyword using the advanced keyword selection panel is available as in the metadata editor:

```
<search>
 <!-- Display or not keyword selection panel in advanced search panel
  <keyword-selection-panel/>
 -->
</search>
```

## 3.9 GeoNetwork's Administrator Survival Tool - GAST

### 3.9.1 What is GAST?

GAST stands for GeoNetwork's Administrator Survival Tool and is a standalone application whose purpose is to simplify some low level tasks like change of the servlet, configuration of the JDBC account, setup the database and so on. Most of the GAST's facilities work only for the GeoNetwork's installation where GAST is in. This implies that if you are using a servlet container other than Jetty (like Tomcat) you will not be able to change some options (like the servlet's name). Other facilities work for any servlet container but you have to specify the GeoNetwork's URL into the GAST's configuration dialogue.

### 3.9.2 Starting GAST

GAST belongs to the core components so it is installed by default.

On Windows computers, simply select the Start GAST option under the GeoNetwork opensource program group under *Start* → *Programs* → *GeoNetwork opensource*

Other options to start GAST are either to use a Java command **from a terminal window** or just click its jar's icon. To issue the Java command you have to:

1. change directory to the GeoNetwork installation folder
2. issue the command `java -jar gast/gast.jar`

GAST will be in current system language if any translation is available. If you want to force GAST GUI language, you could start GAST using the -Duser.language option (e.g. `./gast.sh -Duser.language=fr` or `java -Duser.language=fr -jar gast/gast.jar`).

You can also try to simply open the GeoNetwork installation folder, go to the gast folder and double click on the gast.jar file. If you have Java installed, GAST should start in a few seconds.

To run, GAST requires Java 1.5. It will not work on Java 1.4 and it should run on Java 1.6.

### 3.9.3 Operating modes

On the left side you have a panel with the tools you can use. After selecting a tool, on the right side you get the tool's options panel.

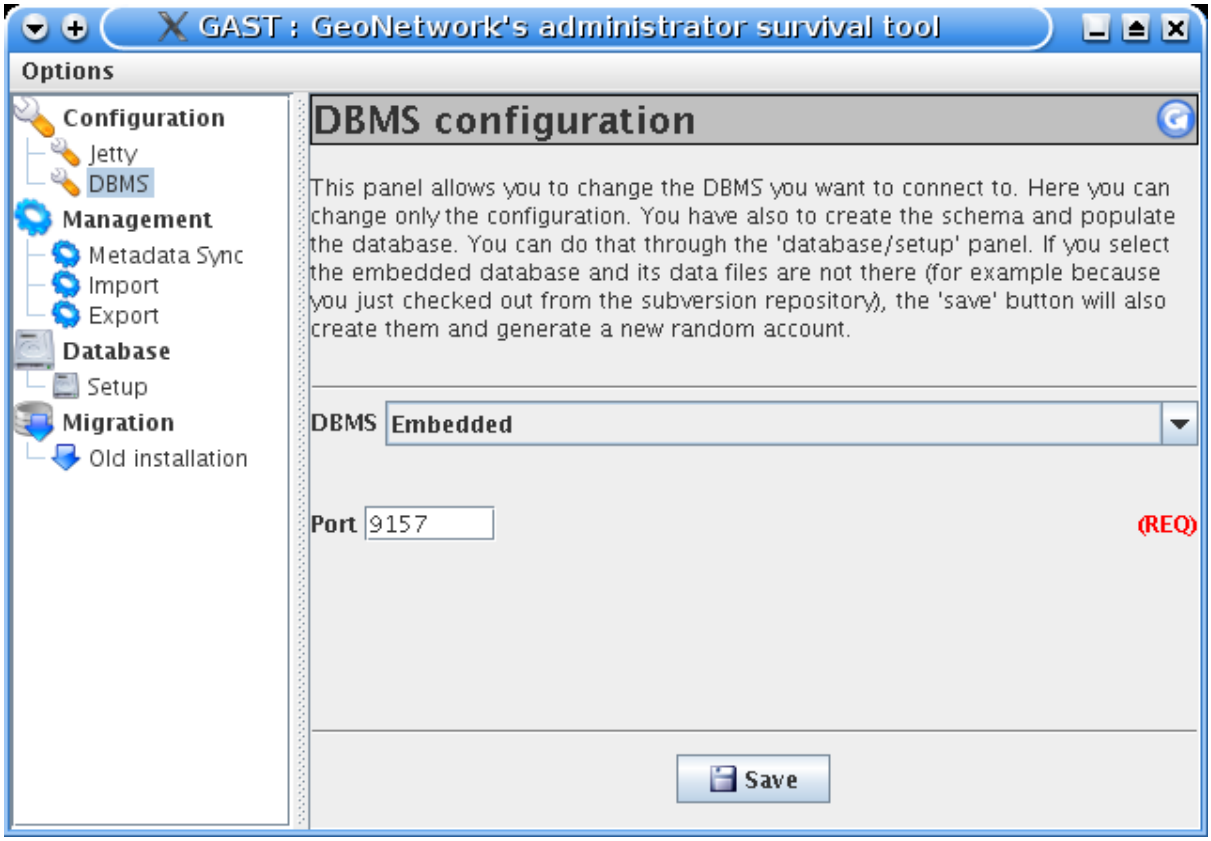

GAST : GeoNetwork's administrator survival tool
Options
Configuration
Jetty
DBMS
Management
Metadata Sync
Import
Export
Database
Setup
Migration
Old installation
DBMS configuration
This panel allows you to change the DBMS you want to connect to. Here you can change only the configuration. You have also to create the schema and populate the database. You can do that through the 'database/setup' panel. If you select the embedded database and its data files are not there (for example because you just checked out from the subversion repository), the 'save' button will also create them and generate a new random account.
DBMS
Embedded
Port
9157
(REQ)
Save

Figure 3.40: *GAST's main window with a tool selected*

Every function has an operating mode, which defines the condition under which the tool can be used. The tool's mode is shown with an icon on the right side of the tool's name. The operating modes, with their icons are summarised in the following table:

| Mode | Icon | Description |
|---|---|---|
| Restarte | | The tool can be always used, but GeoNetwork must be restarted in order to make the change effective. |
| Running | | The tool can be used only if GeoNetwork is running. |
| Stopped | | The tool can be used only if GeoNetwork is stopped. This is important because some tools change the database's account or create the database from scratch. These are sensitive operations that cannot be performed while GeoNetwork is running. |

### 3.9.4 Tools subdivision

All GAST tools present into the left panel are logically subdivided into groups. Each group represents a GeoNetwork's aspect for which GAST allows you a graphic interface. The groups are:

Configuration You can change some configuration parameters, like the servlet's name, JDBC account etc... Management General purpose tools related to the site's administration. Database Operations that regard the database. Here you can find tools to create a database from scratch, creating the schema and filling it with proper data. Migration Tools that allow you to migrate metadata from old installation.

### 3.9.5 Server and Account configuration dialogue

Some of the GAST's tools access a running GeoNetwork application. Usually, GAST connects to GeoNetwork using the connection parameters it finds on the installation folder but you can specify other parameters in order to connect to other instances. This is required when the GeoNetwork instance is not running on the embedded Jetty server. In addition to that, some tools require authentication so account parameters must be provided.

To provide these parameters, you have to use the GAST 's configuration dialogue. To open the dialogue, select `Options >> Config` from the menu bar. You will get the following dialogue:

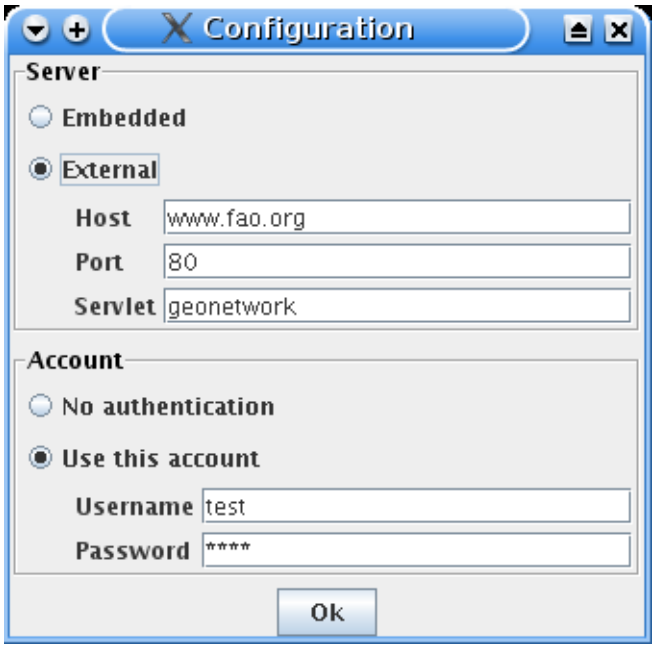



Figure 3.41: *The configuration dialogue*

The dialogue is subdivided into 2 areas:

- **Server** - Tells GAST how to connect to a running GeoNetwork. If you select the embedded option, GAST will get the connection parameters from the installation directory. Alternatively, if you use Tomcat or an external servlet container you have to choose the external option and provide the connection parameters yourself. Remember that this will work only for tools which operating mode is *Running*. For all the others, GAST will access the parameters from the installation directory.
- **Account** - Some tools require authentication. To authenticate, simply select the Use this account option and provide the username and password of a valid account. These parameters will work for both the embedded instance and for any external instance.

## 3.10 Localization

### 3.10.1 Localization of dynamic user interface elements

The user interface of GeoNetwork can be localized into several languages through XML language files. Beside static text, there is also more dynamic text that can be added and changed interactively. This text is stored in the database and is translated using the Localization form that is part of the administrative functions.

Figure 3.42: *How to open the Localization form*

The form allows you to localize the following entities: *Groups*, *Categories*, *Operations* and *Regions*. The localization form is subdivided in a left and a right panel.

The left panel allows you to choose which elements you want to edit. On the top, a dropdown let you choose which entity to edit. All elements of the selected type are shown in a list.

When you select an element from the list, the right panel will show the text as it will be displayed in the user interface. The text in the source language is read only while you can update the text in the target language field.

**Note:** You can change the source and target languages to best suit your needs. Some users may for instance prefer to translate from French to Spanish, others prefer to work with English as the source language.

Use the Save button to store the updated label and move to the next element.

**Warning:** If the user changes a label and chooses another target language without saving, the label change is lost.

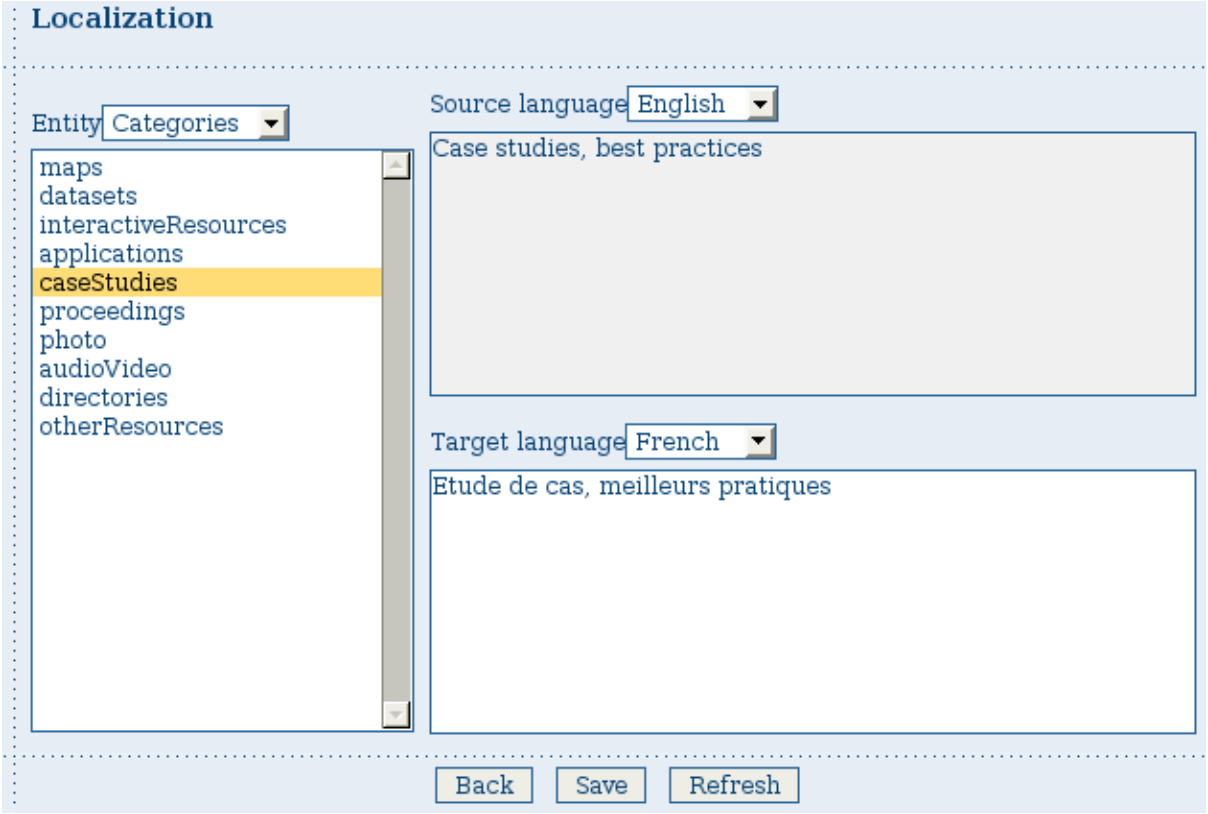



Figure 3.43: *The Localization form*

## 3.11 Import / export tools

### 3.11.1 Introduction

Using GAST, you can import and export metadata at will. It allows you to:

1. Create a *backup* of the entire metadata set. Each metadata has its own file, including maps and other data files. Once you have the backup, you can decide to import all or only some of them.
2. *Move your metadata* from one GeoNetwork catalogue to another. This can be done to mirror your metadata or to upgrade an old installation. In the last case, you export your metadata from your old installation and then re-import them into the new one.

3. Fill the system with *test data*. Using the 'skip UUID' option, you can re-import the same metadata over and over again. This is useful, for example, if you want to perform stress tests.

Metadata are exported in the MEF format.

**Warning: Ownership** - Please, consider that the MEF format version 1.0 does not take into account user and group ownership. When exporting metadata, you loose this information. When importing metadata, the new owner becomes the user that is performing the import while the group ownership is set to null.

### 3.11.2 Import

This tool is located under Management tools on the left panel and allows you to import a set of metadata that have been previously exported using the export facility. Selecting the Import tool opens the option panel.

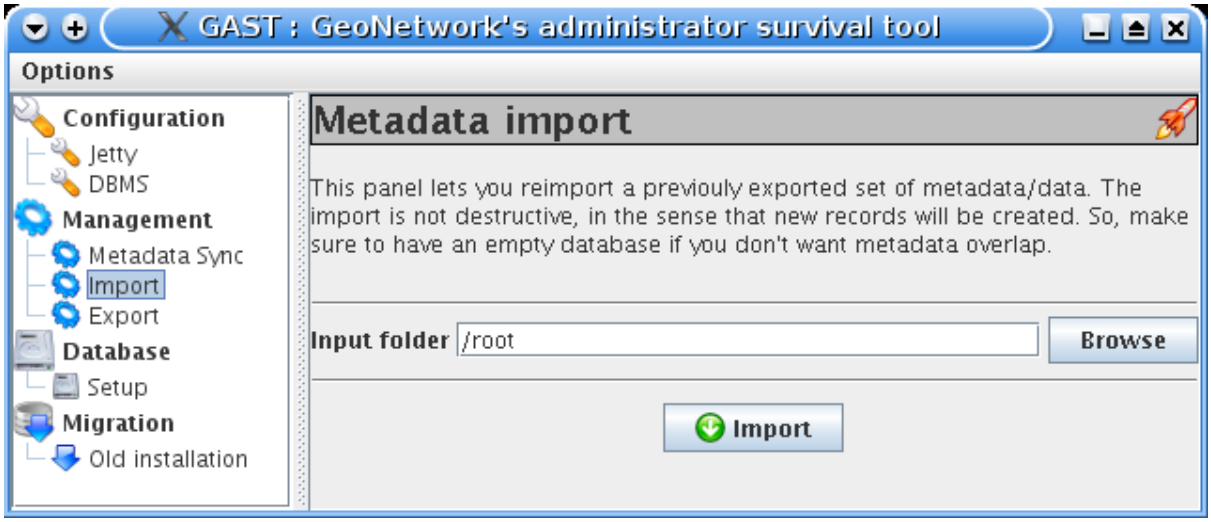



Figure 3.44: *The metadata import panel*

- **Input folder** - The source folder in your system that GAST will scan to collect metadata to import. GAST will try to import all files with the MEF extension.
- **Browse button** - Navigate through your file system to choose an output location or enter it manually into the text field.
- **Import** - This will start the process. A progress dialogue will be opened to show the import status.

**Note:** Sub-folders are not scanned.

### 3.11.3 Export

This tool is located under the Management tool on the left panel and allows you to export a set of metadata using the MEF format. Selecting the Export tool opens the option panel.

- **Output folder** - The target folder in your file system where GAST will put the exported metadata. You can either select the Browse button to navigate through your file system to choose a better location or enter it manually in the text field.

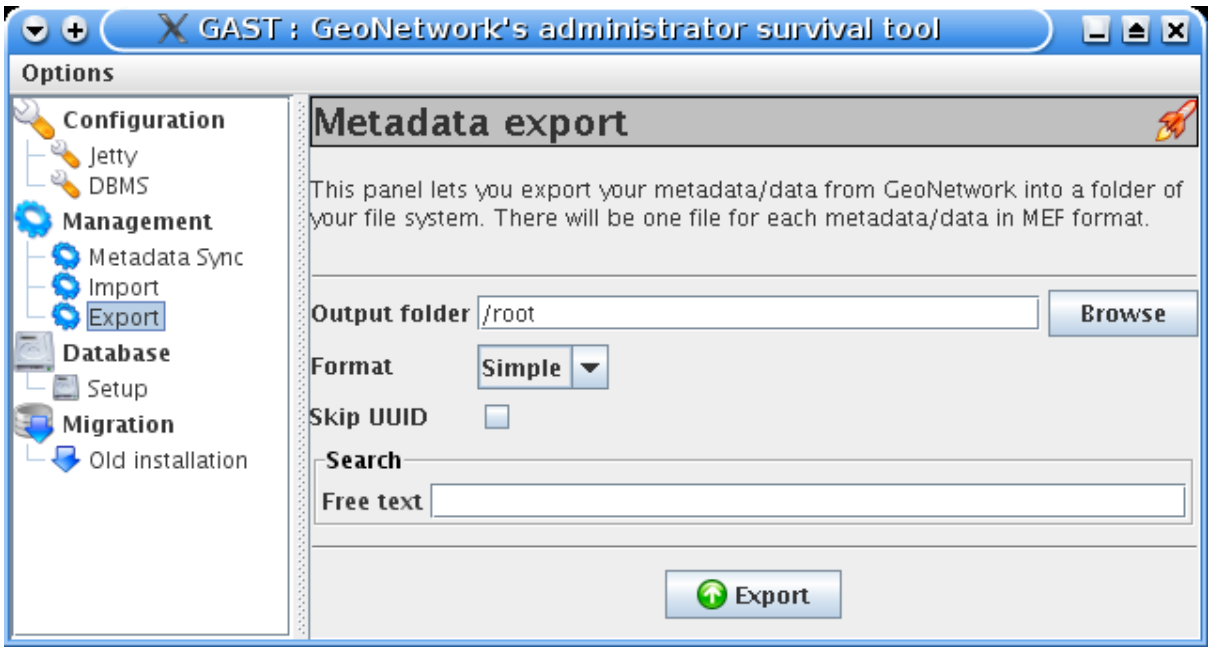



Figure 3.45: *The metadata export panel*

- **Format** - Here you can specify the metadata's output format. See the MEF specification for more information.
- **Skip UUID** - Normally this option is not required. If you select it, you will loose the metadata's unique identifier (UUID) but you will be able to re-import that metadata over and over again. This is useful to fill the system with test data.
- **Search** - Allows to specify free text search criteria to limit the set of exported records.
- **Export** - This will start the export process. A progress dialogue will be opened to show the export status.

**Note:** The result of the export will depend on the access privileges of the user. If you do not authenticate, you will get only public metadata.

**Warning:** Skipping the UUID on import or export can cause metadata to be duplicated. This should normally always be avoided

CHAPTER 4

# Glossary of Metadata Fields Description

This glossary provides you with brief descriptions of the minimum set of metadata fields required to properly describe a geographical data as well as some optional elements highly suggested for a more extensive standard description.

**Access constraints** Access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the resource

**Abstract** Brief narrative summary of the content of the resource(s)

**Administrative area** State, province of the location

**Temporal extent - Begin date** Formatted as 2007-09-12T15:00:00 (YYYY-MM-DDTHH:mm:ss)

**Character set** Full name of the character coding standard used for the metadata set

**Grid spatial representation - Cell geometry** Identification of grid data as point or cell

**City** City of the location

**Reference System Info - Code** Alphanumeric value identifying an instance in the namespace

**Country** Country of the physical address

**Data quality info** Provides overall assessment of quality of a resource(s)

**Date** Reference date and event used to describe it (YYYY-MM-DD)

**Date stamp** Date that the metadata was created (YYYY-MM-DDThh:mm:ss)

**Date type** Event used for reference date

**Delivery point** Address line for the location (as described in ISO 11180, annex A)

**Equivalent scale - Denominator** The number below the line in a vulgar fraction

**Data Quality - Description** Description of the event, including related parameters or tolerances

**OnLine resource - Description** Detailed text description of what the online resource is/does

**Descriptive keywords** Provides category keywords, their type, and reference source

**Grid spatial representation - Dimension name** Name of the axis i.e. row, column

**Grid spatial representation - Dimension size** Number of elements along the axis

**Dimension size Resolution** Number of elements along the axis

**Distribution info** Provides information about the distributor of and options for obtaining the resource(s)

**Geographic bounding box - East bound longitude** Eastern-most coordinate of the limit of the dataset extent, expressed in longitude in decimal degrees (positive east)

**Edition** Version of the cited resource

**Electronic mail address** Address of the electronic mailbox of the responsible organisation or individual

**Temporal extent - End date** Formatted as 2007-09-12T15:00:00 (YYYY-MM-DDTHH:mm:ss)

**Equivalent scale** Level of detail expressed as the scale of a comparable hardcopy map or chart

**Extent** Information about spatial, vertical, and temporal extent

**Facsimile** Telephone number of a facsimile machine for the responsible organisation or individual

**File identifier** Unique identifier for this metadata file

**Vector spatial representation - Geometric object type** Name of point and vector spatial objects used to locate zero-, one-and two-dimensional spatial locations in the dataset

**Vector spatial representation - Geometric object count** Total number of the point or vector object type occurring in the dataset

**Geographic bounding box** Geographic position of the dataset

**Grid spatial representation** Information about grid spatial objects in the dataset

**Grid spatial representation - Resolution value** Degree of detail in the grid dataset

**Grid spatial representation - Transformation parameter availability** Indication of whether or not parameters for transformation exists

**Data Quality - Hierarchy level** Hierarchical level of the data specified by the scope

**Identification info** Basic information about the resource(s) to which the metadata applies

**Point of Contact - Individual name** Name of the responsible person- surname, given name, title separated by a delimiter

**Keyword** Commonly used word(s) or formalised word(s) or phrase(s) used to describe the subject

**Data Language** Language used for documenting data

**Metadata - Language** Language used for documenting metadata

**Data Quality - Lineage** Non-quantitative quality information about the lineage of the data specified by the scope. Mandatory if report not provided

**OnLine resource - Linkage** Location (address) for on-line access using a Uniform Resource Locator address or similar addressing scheme such as http://www.statkart.no/isotc211

**Maintenance and update frequency** Frequency with which changes and additions are made to the resource after the initial resource is completed

**Metadata author** Party responsible for the metadata information

**Metadata standard name** Name of the metadata standard (including profile name) used

**Metadata standard version** Version (profile) of the metadata standard used

**OnLine resource - Name** Name of the online resource

**Geographic bounding box - North bound latitude** Northern-most, coordinate of the limit of the dataset extent expressed in latitude in decimal degrees (positive north)

**Grid spatial representation - Number of dimensions** Number of independent spatial-temporal axes

**Distribution Info - OnLine resource** Information about online sources from which the resource can be obtained

**Point of Contact - Organisation name** Name of the responsible organisation

**Other constraints** Other restrictions and legal prerequisites for accessing and using the resource

**Point of contact** Identification of, and means of communication with, person(s) and organisations(s) associated with the resource(s)

**Point of contact - Position name** Role or position of the responsible person

**Postal code** ZIP or other postal code

**Presentation form** Mode in which the resource is represented

**OnLine resource - Protocol** Connection protocol to be used

**Purpose** Summary of the intentions with which the resource(s) was developed

**Reference system info** Description of the spatial and temporal reference systems used in the dataset-Data

**Data Quality - Report** Quantitative quality information for the data specified by the scope. Mandatory if lineage not provided

**Grid spatial representation - Resolution value** Degree of detail in the grid dataset

**Point of contact - Role** Function performed by the responsible party

**Geographic bounding box - South bound latitude** Southern-most coordinate of the limit of the dataset extent, expressed in latitude in decimal degrees (positive north)

**Spatial representation info** Digital representation of spatial information in the dataset

**Spatial representation type** Method used to spatially represent geographic information

**Data Quality - Statement** General explanation of the data producer's knowledge about the lineage of a dataset

**Status** Status of the resource(s)

**Supplemental Information** Any other descriptive information about the dataset

**Temporal Extent** Time period covered by the content of the dataset

**Title** Name by which the cited resource is known

**Topic category code** High-level geographic data thematic classification to assist in the grouping and search of available geographic data sets. Can be used to group keywords as well. Listed examples are not exhaustive. NOTE It is understood there are overlaps between general categories and the user is encouraged to select the one most appropriate.

**Grid spatial representation - Transformation parameter availability** Indication of whether or not parameters for transformation exists

**Vector spatial representation - Topology level** Code which identifies the degree of complexity of the spatial relationships

**Type** Subject matter used to group similar keywords

**URL** Unified Resource Locator

**Use constraints** Constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations or warnings on using the resource

**Vector spatial representation** Information about the vector spatial objects in the dataset

**Voice** Telephone number by which individuals can speak to the responsible organisation or individual

**Geographic bounding box - West bound longitude** Western-most coordinate of the limit of the dataset extent, expressed in longitude in decimal degrees (positive east)

CHAPTER 5

# ISO Topic Categories

Iso Topic Categories and Keywords

| Isotopic Category | Main Topic | Examples | Keywords |
|---|---|---|---|
| ***Base Maps*** | Base Maps, Scanned Maps, and Charts | | Base Map |
| ***Biota*** | Biologic and Ecologic Information Flora and/or fauna in natural environment | wildlife, vegetation, biological sciences, ecology, wilderness, sea life, wetlands, habitat | |
| ***Boundaries*** | Administrative Legal land descriptions and Political Boundaries | political and administrative boundaries | Administrative boundaries, |
| ***Climatology Meteorology Atmosphere*** | cloud cover, weather, climate, atmospheric conditions, climate change, precipitation | | NDVI, Drought, Floods |
| ***Earth Cover*** | Earth Surface Characteristics and Land Cover | | Land Cover |
| ***Economy*** | Business and Economic Information, Economic activities, conditions and employment | production, labour, revenue, commerce, industry, tourism and ecotourism, forestry, fisheries, commercial or subsistence hunting, exploration and exploitation of resources such as minerals, oil and gas | |
| ***Elevation*** | Elevation and Derived Products, Height above or below sea level | altitude, bathymetry, digital elevation models, slope, derived products | Digital Elevation Model |
| ***Environment*** | Environmental Monitoring and Modelling, Environmental resources, protection and conservation | environmental pollution, waste storage and treatment, environmental impact assessment, monitoring environmental risk, nature reserves, landscape | |
| ***Farming*** | Agriculture and Farming Rearing of animals and/or cultivation of plants | agriculture, irrigation, aquaculture, plantations, herding, pests and diseases affecting crops and livestock | Agriculture, Crop Production, Livestock |
| ***Geoscientific Information*** | Geologic and Geophysical Information, Information pertaining to earth sciences | geophysical features and processes, geology, minerals, sciences dealing with the composition, structure and origin of the earth's rocks, risks of earthquakes, volcanic activity, landslides, gravity | |

| | | | |
|---|---|---|---|
| | | information, soils, permafrost, hydrogeology, erosion | |
| ***Health*** | Human Health and Health, health services, human ecology, and Disease safety | disease and illness, factors affecting health, hygiene, substance abuse, mental and physical health, health services | Malnutrition, Wasting, Stunting, Underweight, Food Deficit, Crop Disease, Livestock Disease, |
| ***Imagery*** | Images and Photographs | | |
| ***Imagery Base Maps Earth Cover*** | Base maps | land cover, topographic maps, imagery, unclassified images, annotations | |
| ***Inland Waters*** | Inland Water Resources and Characteristics, Inland water features, drainage systems and their characteristics | rivers and glaciers, salt lakes, water utilisation plans, dams, currents, floods, water quality, hydrographic charts | Rivers, |
| ***Intelligence Military*** | Military bases, structures, activities | barracks, training grounds, military transportation, information collection | |
| ***Location*** | Geodetic Networks Positional information and services and Control Points | addresses, geodetic networks, control points, postal zones and services, place names | Cartography |
| ***Oceans*** | Ocean and Estuarine Resources and Characteristics(excluding inland waters), Features and characteristics of salt water bodies | tides, tidal waves, coastal information, reefs | |
| ***Planning Cadastre*** | Cadastral and Legal Land Descriptions. Information used for appropriate actions for future use of the land | land use maps, zoning maps, cadastral surveys, land ownership | |
| ***Recreation*** | Tourism and Recreation | | |
| ***Society*** | Society and Cultural and Demographic Information, Characteristics of society and cultures | Settlements, anthropology, archaeology, education, traditional beliefs, manners and customs, demographic data, recreational areas and activities, social impact assessments, crime and justice, census information | Vulnerability, Early Warning, Emergency, IDPS, Refugees, Population, Poverty, Food Security, Regional Bureaux, WFP Facilities, School feeding |
| ***Structure*** | Facilities, Man-made construction, Buildings and Structures | buildings, museums, churches, factories, housing, monuments, shops, towers | |
| ***Transportation*** | Transportation Means and aids for conveying persons and/or goods, Networks and Models | roads, airports/airstrips, shipping routes, tunnels, nautical charts, vehicle or vessel location, aeronautical | Infrastructure, COMPAS, Food Aid, Food Beneficiaries, Railways, Roads, Shipments |

| | | | |
|---|---|---|---|
| | | charts, railways | |
| ***Utilities Communication*** | Utility Distribution Networks, Energy, water and waste systems and communications infrastructure and services | hydroelectricity, geothermal, solar and nuclear sources of energy, water purification and distribution, sewage collection and disposal, electricity and gas distribution, data communication, telecommunication, radio, communication networks | |

# Free and Open Source Software for Geospatial Information Systems

A range of related software packages can be used in addition to GeoNetwork opensource to deploy a full Spatial Data Infrastructure. These include Web Map Server software, GIS desktop applications and Web Map Viewers.

Below you will find some examples of open source software available for each categories.

## 6.1 Web Map Server software

- GeoServer (All)
- MapServer (All)
- MapGuide Open Source (Windows & Linux)
- Deegree (All)

## 6.2 GIS Desktop software

- GRASS (All)
- gvSIG (All)
- uDig (All)
- Quantum GIS (All)
- OSSIM (Windows & OSX)

## 6.3 Web Map Viewer and Map Server Management

- OpenLayers (All)
- MapBender (All)

**Note:** All = The Windows, Linux and Mac OS X operating systems.

CHAPTER 7

# Frequently Asked Questions

This is a list of frequently encountered problems, suggestions that help to find the cause of the problem and possible solutions. The list is by no means exhaustive. Feel free to contribute by submitting new problems and their solutions to the developer mailinglist.

**Note:** <install directory> is a placeholder for the GeoNetwork installation directory.

<some file> should be read as some random file name.

> **Warning:** Be very careful when issuing commands on the terminal! You can easily damage your operating system with no way back. If you are not familiar with using the terminal: **don't do it, contact an expert instead!** Make a backup of your data before you make any of the suggested changes below!

## 7.1 HTTP Status 400 Bad request

Check the availability and write permissions of the data and tmp directories.

See *The data and data/tmp directories*

## 7.2 Metadata insert fails

Inserting an XML or MEF file through the Metadata insert form fails silently. Verify if the data directory is available and writable.

See *The data and data/tmp directories*

## 7.3 Thumbnail insert fails

Nothing happens when inserting a thumbnail through the wizard in the metadata editor.

Error in your log file looks like:

```
HTTP Status 400 - Cannot build ServiceRequest Cause : <install directory>/data/tmp/<some
```

Then check *The data and data/tmp directories*

## 7.4 The data and data/tmp directories

On Linux or OS X systems verify from a terminal if the data directory is existing and is writable.

**ls -la <install directory>/data**

This should show the permissions on the data directory. For example:

```
total 0
drwxr-xr-x   6 tomcat  tomcat  204 19 jan 15:34 .
drwxr-xr-x   8 tomcat  tomcat  272 23 dec 19:30 ..
drwxr-xr-x  10 tomcat  tomcat  340 19 jan 15:47 00000-00099
drwxr-xr-x  21 tomcat  tomcat  714 23 dec 19:30 geoserver_data
drwxr-xr-x   3 tomcat  tomcat  102 23 dec 19:30 removed
drwxr-xr-x   3 tomcat  tomcat  102 19 jan 15:47 tmp
```

The above example shows that only the user tomcat has write access on the directories listed. All other users have read (and execute) rights only. See http://en.wikipedia.org/wiki/Filesystem_permissions for more details on file permissions.

Make sure your web server is running as user tomcat. Check this with the command:

**ps aux | grep tomcat**

You should see the processes that have tomcat in their description. Something like this:

```
bash-3.2# ps aux | grep tomcat
tomcat     22253   0,7  0,0  2435120    532 s000  S+    5:03pm   0:00.00 grep tomcat
tomcat     22251   0,0  1,9  2861960  80596 s000  S     5:03pm   0:03.85 /System/Library
```

If all is well, the user referred to at the start of this string (in this case tomcat) is the same user that has write permissions on the data and tmp directories.

You now have two possible solutions:

- Make the data and temporary directories writable to all users. You can change this using the command:

**chmod -R a+w <install directory>/data**

Your permissions should now look like this:

```
drwxrwxrwx   6 tomcat  tomcat  204 19 jan 15:34 .
etc..
```

**Note:** the 'w' refers to 'write' access

- The second solution is to ensure the user running the webserver is the same user that holds write access to the data directory (in this case tomcat). For this, you can (a) change the user running the process, or (b) change ownership of the directory using the chown command:

**chown -R tomcat:tomcat <install directory>/data**

CHAPTER 8

# Glossary

**ebRIM** Enterprise Business Registry Information Model..

**CSW** Catalog Service for the Web. The OGC Catalog Service defines common interfaces to discover, browse, and query metadata about data, services, and other potential resources.

**ISO** International Standards Organisation is an international-standard-setting body composed of representatives from various national standards organizations. http://www.iso.org

**ISO TC211** ISO/TC 211 is a standard technical committee formed within ISO, tasked with covering the areas of digital geographic information (such as used by geographic information systems) and geomatics. It is responsible for preparation of a series of International Standards and Technical Specifications numbered in the range starting at 19101.

**GeoNetwork** GeoNetwork opensource is a standards based, Free and Open Source catalog application to manage spatially referenced resources through the web. http://geonetwork-opensource.org

**GPL** The GNU General Public License is a free, copyleft license for software and other kinds of works. GeoNetwork opensource is released under the GPL 2 license. http://www.gnu.org/licenses/old-licenses/gpl-2.0.html

**Creative Commons** GeoNetwork documentation is released under the Creative Commons Attribution-ShareAlike 3.0 Unported License. Find more information at http://creativecommons.org/licenses/by-sa/3.0/

**XML** Extensible Markup Language is a general-purpose specification for creating custom markup languages.

**XSD** XML Schema, published as a W3C recommendation in May 2001, is one of several XML schema languages. http://en.wikipedia.org/wiki/XSD

**ebXML** Enterprise Business XML.

**DAO** Data Access Object.

**CRUD** Create Read Update and Delete.

**DB (or DBMS)** A database management system (DBMS) is computer software that manages databases. DBMSes may use any of a variety of database models, such as the network model or relational model. In large systems, a DBMS allows users and other software to store and retrieve data in a structured way.

**SOA** Service Oriented Architecture provides methods for systems development and integration where systems package functionality as interoperable services. A SOA infrastructure allows different applications to exchange data with one another.

**FGDC** The Federal Geographic Data Committee (FGDC) is an interagency committee that promotes the coordinated development, use, sharing, and dissemination of geospatial data on a national basis in the USA. See http://www.fgdc.gov

**JMS** Java Messaging Service.

**TDD** Test Driven Development.

**JIBX** Binding XML to Java Code.

**HQL** Hibernate Query Language.

**OO** Object Oriented.

**EJB** Enterprise Java Beans.

**SOAP** Simple Object Access Protocol is a protocol specification for exchanging structured information in the implementation of Web Services in computer networks.

**OGC** Open Geospatial Consortium. A standards organization for geospatial information systems http://www.opengeospatial.org

**OSGeo** The Open Source Geospatial Foundation (OSGeo), is a non-profit non-governmental organization whose mission is to support and promote the collaborative development of open geospatial technologies and data. http://www.osgeo.org

**FAO** Food and Agriculture Organisation of the United Nations is a specialised agency of the United Nations that leads international efforts to defeat hunger. http://www.fao.org

**WFP** World Food Programme of the United Nations is the food aid branch of the United Nations, and the world's largest humanitarian organization. http://www.wfp.org

**UNEP** The UN Environment Programme (UNEP) coordinates United Nations environmental activities, assisting developing countries in implementing environmentally sound policies and encourages sustainable development through sound environmental practices. http://www.unep.org

**OCHA** United Nations Office for the Coordination of Humanitarian Affairs is designed to strengthen the UN's response to complex emergencies and natural disasters. http://ochaonline.un.org/

**URL** A Uniform Resource Locator specifies where an identified resource is available and the mechanism for retrieving it.

**GAST** GeoNetwork Administrator Survival Tool. A desktop application that allows administrators of a GeoNetwork catalog to perform a range of admin operations.

**WebDAV** Web-based Distributed Authoring and Versioning. WebDAV is a set of extensions to the Hypertext Transfer Protocol (HTTP) that allows users to edit and manage files collaboratively on remote World Wide Web servers.

**OAI-PMH** Open Archive Initiative Protocol for Metadata Harvesting. It is a protocol developed by the Open Archives Initiative. It is used to harvest (or collect) the metadata descriptions of the records in an archive so that services can be built using metadata from many archives.

**WMS** Web Map Service is a standard protocol for serving georeferenced map images over the Internet that are generated by a map server using data from a GIS database. The specification was developed and first published by the Open Geospatial Consortium in 1999.

**WFS** Web Feature Service provides an interface allowing requests for geographical features across the web using platform-independent calls. One can think of geographical features as the "source code" behind a map.

**WCS** Web Coverage Service provides an interface allowing requests for geographical coverages across the web using platform-independent calls. The coverages are objects (or images) in a geographical area

**WPS** Web Processing Service is designed to standardize the way that GIS calculations are made available to the Internet. WPS can describe any calculation (i.e. process) including all of its inputs and outputs, and trigger its execution as a Web Service.

**UUID** A Universally Unique Identifier (UUID) is an identifier standard used in software construction, standardized by the Open Software Foundation (OSF) as part of the Distributed Computing Environment (DCE).

**MAC address** Media Access Control address (MAC address) is a unique identifier assigned to most network adapters or network interface cards (NICs) by the manufacturer for identification, and used in the Media Access Control protocol sublayer. See also http://en.wikipedia.org/wiki/MAC_address on Wikipedia

**MEF** Metadata Exchange Format. An export format developed by the GeoNetwork community. More details can be found in this manual in Chapter Metadata Exchange Format.

**SKOS** The Simple Knowledge Organisation Systems (SKOS) is an area of work developing specifications and standards to support the use of knowledge organisation systems (KOS) such as thesauri, classification schemes. http://www.w3.org/2004/02/skos/

**Z39.50 protocol** Z39.50 is a client-server protocol for searching and retrieving information from remote computer databases. It is covered by ANSI/NISO standard Z39.50, and ISO standard 23950. The standard's maintenance agency is the Library of Congress.

**SMTP** Simple Mail Transfer Protocol is an Internet standard for electronic mail (e-mail) transmission across Internet Protocol (IP) networks.

**LDAP** Lightweight Directory Access Protocol is an application protocol for querying and modifying directory services running over TCP/IP.

**Shibboleth** The Shibboleth System is a standards based, open source software package for web single sign-on across or within organisational boundaries. It allows sites to make informed authorisation decisions for individual access of protected online resources in a privacy-preserving manner.

**DC** The Dublin Core metadata element set is a standard for cross-domain information resource description. It provides a simple and standardised set of conventions for describing things online in ways that make them easier to find.

**ESA** European Space Agency is an intergovernmental organisation dedicated to the exploration of space. http://www.esa.int

**FOSS** Free and Open Source Software, also F/OSS, FOSS, or FLOSS (free/libre/open source software) is software which is liberally licensed to grant the right of users to study, change, and improve its design through the availability of its source code. http://en.wikipedia.org/wiki/FOSS

**JDBC** The Java Database Connectivity (JDBC) API is the industry standard for database-independent connectivity between the Java programming language and a wide range of databases – SQL databases and other tabular data sources, such as spreadsheets or flat files. The JDBC API provides a call-level API for SQL-based database access. JDBC technology allows you to use the Java programming language to exploit "Write Once, Run Anywhere" capabilities for applications

that require access to enterprise data. With a JDBC technology-enabled driver, you can connect all corporate data even in a heterogeneous environment.

# Index


## C

Creative Commons, 127
CRUD, 127
CSW, 127

## D

DAO, 127
DB (or DBMS), 127
DC, 129

## E

ebRIM, 127
ebXML, 127
EJB, 128
ESA, 129

## F

FAO, 128
FGDC, 128
FOSS, 129

## G

GAST, 128
GeoNetwork, 127
GPL, 127

## H

HQL, 128

## I

import
    MEF, 74
    XML, 74
ISO, 127
ISO TC211, 127

## J

JDBC, 129
JIBX, 128
JMS, 128

## L

LDAP, 129

## M

MAC address, 129
MEF, 129
    import, 74

## O

OAI-PMH, 128
OCHA, 128
OGC, 128
OO, 128
OSGeo, 128

## S

Shibboleth, 129
SKOS, 129
SMTP, 129
SOA, 127
SOAP, 128

## T

TDD, 128

## U

UNEP, 128
URL, 128
UUID, 129

## W

WCS, 129
WebDAV, 128
WFP, 128
WFS, 128

WMS, 128
WPS, 129

## X

XML, 127
    import, 74
XSD, 127

## Z

Z39.50 protocol, 129